SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN A TERTIARY CARE HOSPITAL

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DECLARATION

I declare that the thesis entitled **"SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN A TERTIARY CARE HOSPITAL"** has been prepared by me under the guidance of **Dr. Gautam Ahluwalia**, Professor, Department of Medicine, **Dr. Akashdeep Singh**, Professor, Department of Pulmonary Medicine and **Dr. Pavneet Kaur Selhi**, Professor, Department of Pathology, Dayanand Medical College and Hospital, Ludhiana. No part of this thesis has formed the basis for the award of any degree previously.

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Dedicated

to

my Family

&

Teachers

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Dr. Neeraj Saini…

LIST OF ABBREVIATIONS

%	Percentage
ADA	Adenosine Deaminase
AFB	Acid Fast Bacilli
AFL	Air Fluid Level
AKI	Acute Kidney Injury
ALP	Alkaline Phosphatase
ATT	Anti Tubercular Treatment
BA	Bronchial Asthma
BAL	Bronchioalveolar Lavage
BMI	Body Mass Index
BNP	Brain Natriuretic Peptide
BP FISTULA	Broncho-Pleural Fistula
C/S	Culture and Sensitivity
Ca	Calcium
CAD	Coronary Artery Disease
CBC	Complete Blood Count
CBNAAT	Cartridge-Based Nucleic Amplification Test
CKD	Chronic Kidney Disease
Cl-	Chloride
CLD	Chronic Liver Disease
COPD	Chronic Obstructive Pulmonary Disease
CT	Computed Tomography
CVA	Cerebrovascular Accident
CVA	Cerebrovascular Accident
CXR	Chest Radiograph
DAMA	Discharge Against Medical Advice
DBP	Diastolic Blood Pressure
DENGUE NS1	Dengue Non Structural Protein 1
DLC	Differential Leucocyte Count

DM	Diabetes Mellitus
DM	Diabetes Mellitus
EF	Ejection Fraction
ESR	Erythrocyte Sedimentation Rate
F	Female
F/U	Follow Up
GB	Gall Bladder
GGO	Ground Glass Opacity
GHK	Global Hypokinesia
GPE	General Physical Examination
HAV	Hepatitis A Virus
Hb	Hemoglobin
HBs AG	Hepatitis B Surface Antigen
HEV	Hepatitis E Virus
HFnEF	Heart Failure With Normal Ejection Fraction
HFrEF	Heart Failure With Reduced Ejection Fraction
HIV	Human Immunodeficiency Virus
HTN	Hypertension
IBD	Inflammatory Bowel Disease
ICD	Inter Coastal Drainage
ICU	Intensive Care Unit
ILD	Interstitial Lung Disease
JVP	Jugular Venous Pressure
K+	Potassium
L/N	Lymphocyte To Neutrophil
LA	Left Atrium
LAP	Lymphadenopathy
LDH	Lactate Dehydrogenase
LFT	Liver Function Test
LPA	Line Probe Assay

LVH	Left Ventricle Hypertrophy
M	Male
MAC	Mitral Annular Calcification
Mg+	Magnesium
MMRC	Modified Medical Research Council
MRSA	Methicillin Resistant Staphlococcus Aureus
N	Number Of Patients
Na+	Sodium
OSA	Obstructive Sleep Apnoea
PAH	Pulmonary Arterial Hypertension
PCP	Pneumocystis Pneumonia
PCR	Polymerase Chain Reaction
PET SCAN	Positron Emission Tomography Scan
Pf	Pleural Fluid
Phos	Phosphate
PLHIV	People Living With Human Immunodeficiency Virus
Prot	Protein
PTE	Pulmonary Thromboembolism
RCC	Renal Cell Carcinoma
RFT	Renal Function Test
RPC	Renal Parenchymal Change
RPGN	Rapidly Progressive Glomerulonephritis
RR	Respiratory Rate
RV	Right Ventricle
RWMA	Regional Wall Motion Abnormality
SBP	Systolic Blood Pressure
SD	Standard Deviation
SGOT	Serum Glutamic Oxaloacetic Transaminase
SGPT	Serum Glutamic Pyruvic Transaminase
SLE	Systemic Lupus Nephritis

Stk	Streptokinase
TB	Tuberculosis
TLC	Total Leucocyte Count
TVF	Tactile Vocal Fremitus
URTI	Upper Respiratory Tract Infection
USG	Ultrasonography
UTI	Urinary Tract Infection
VATS	Video Assisted Thoracoscopic Surgery
VRE	Vancomycin Resistant Enterococcus

ABSTRACT

Introduction:- Unilateral pleural effusion is a challenge for the physician as the differential diagnosis is varied. Evidence-based decision needs robust information about the etiology and epidemiology of a disease in a particular region. The etiology can vary according to the geographical area, outpatient or inpatient health-care setting, patient age, among other factors.

Aim of Study:- 1.To study the spectrum of admitted adult patients aged > 18 years with unilateral pleural effusion in a tertiary care hospital. 2. To study the outcome in these patients; wherever feasible

Materials & Methods:- A prospective observational study was conducted on adult patients aged ≥18 years who are hospitalized in Dayanand Medical College & Hospital, Ludhiana. The study was conducted from 1st January 2019 to 31st December 2019.

Results:- Over a period of 1 year, 116 patients admitted with unilateral pleural effusion were evaluated. Standard laboratory tests and clinical examination were performed. 81 (69.8%) patients were males and 35 (30.2%) patients were females. Maximum patients were in age group of 20 to 60 years of age. Most of the unilateral pleural effusions were exudative (85.3%) in nature. Among exudative pleural effusion, tuberculous pleural effusion (45.7%) was the leading cause. It is followed by parapneumonic effusion (12.9%), malignant pleural effusion (10.3%), empyema (6.1%) and pleural effusion secondary to acute pancreatitis (3.4%). Among transudative pleural effusion, heart failure with reduced ejection fraction along with chronic kidney disease was the most common cause. Shortness of breath (56%), fever (53.4%), cough (52.5%), chest pain (35.3%), anorexia (34.5%) and weight loss (18.9%) were the most common presenting symptom. There was no mortality during admission. Most of the effusions resolve with treatment of the underlying cause especially tuberculous pleural effusion. Treatment remained palliative in patients with malignant pleural effusion. Most common cause of mortality was malignancy.

Conclusion:- Tubercular pleural effusion was the most common cause of unilateral pleural effusion in our study and it had good outcome.

Keywords:- unilateral, pleural effusion, clinical presentation, hospitalized patients

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INTRODUCTION

Pleural effusions are a common medical problem with more than 50 recognized causes including disease local to the pleura or underlying lung, systemic conditions, organ dysfunction and drugs.[1] Unilateral pleural effusion is a challenge for the physician as the differential diagnosis is varied. Evidence-based decision needs robust information about the etiology and epidemiology of a disease in a particular region. The etiology can vary according to the geographical area, outpatient or inpatient health-care setting, patient age, advances in the diagnostic methods among other factors.

In developed countries, the common causes of pleural effusions in adults are cardiac failure, malignancy and pneumonia [2, 3], whereas in resource-limited countries, tuberculosis and parapneumonic effusions are more prevalent [4, 5]. In fact, over the years with increasing prevalence of HIV and malignancies, the pattern of unilateral pleural effusion is also evolving with a shift from classical presentations of disease to atypical presentation. The scenario is further compounded by confounding interpretation of laboratory investigations requiring hospitalization to establish a correct diagnosis.

Despite the availability of all tests, it might be necessary to avail more diagnostic tools like pleural biopsy or thoracoscopy to establish a diagnosis. ADA has shown to be reliable to differentiate tubercular from non-tubercular effusion in the Western countries [6]. But in Asian countries its diagnostic value is less because of high prevalence of tuberculosis especially in our country. India has highest prevalence of tuberculosis in the world [7]. Pleural tuberculosis is second in frequency after TB lymphadenitis. Malignant pleural effusion shares similar clinical, biochemical, cytological parameters as of tubercular pleural effusion [8]. There is hence a need for defining the best diagnostic and cost-effective approach to quickly diagnose unilateral pleural effusion.

In our country, there is a paucity of epidemiological data about unilateral pleural effusions, especially in admitted patients. In this study an attempt has been made to study unilateral pleural effusion. This

study is aimed at delineating the etiology and clinical spectrum of unilateral pleural effusion in patients admitted in a tertiary care teaching hospital.

AIMS AND OBJECTIVES

- To study the spectrum of admitted adult patients aged ≥ 18 years with unilateral pleural effusion in a tertiary care hospital.
- To study the outcome in these patients; wherever feasible

REVIEW OF LITERATURE

Pleural effusion is collection of fluid within the pleural space which might be because [9] of increase interstitial fluid in lungs due to increased pulmonary capillary pressure (left ventricular failure, fluid overload), decrease in plasma oncotic pressure (hypoalbuminemia), decreased pleural oncotic pressure causing increased formation (atelectasis, trapped lung), increased permeability (pancreatitis, vasculitis, malignancy), decreased lymphatic drainage (malignancy, yellow nail syndrome), diaphragmatic defects (hepatic hydrothorax) and thoracic duct rupture (chylothorax). In many cases, the etiology is multifactorial.

A basis prospective observational study was conducted by Bintcliffe et al [10] on unilateral pleural effusions with more than one apparent etiology at North Bristol National Health Services Trust (UK). Consecutive patients presenting with an undiagnosed unilateral pleural effusion were taken into study in tertiary care center. Patients underwent a diagnostic evaluation and were followed up for a minimum of 12 months. Two experienced physicians were independently recruited to record one or more diagnosis. 70% of the patients had a single cause for their pleural effusion, and 30% had multiple causes.

The study established the existence of more than one identifiable cause for unilateral pleural effusion. In this study serum N-terminal pro-brain natriuretic peptide (NT-pro BNP) was used in cases of unilateral pleural effusion and concluded that value greater or equal to 1500 pg/ml was predictive of multiple etiologies. NT-pro BNP had a sensitivity and specificity of 79 and 88%, respectively, for establishing heart failure as a primary or contributory factor.

Richard W light et al [11] gave Light's criteria in order to differentiate exudative pleural effusion from transudative pleural effusion. The pleural effusion can be said to be exudative in nature, if one or more of the following criteria are present: (1) the ratio of pleural fluid protein (Pf) to serum protein is greater than 0.5; (2) the ratio of Pf

lactate dehydrogenase (LDH) to serum LDH is greater than 0.6; or (3) the Pf LDH level is greater than two thirds of the upper limit of normal for serum LDH.

Twenty percent [12] of patients with pleural effusion may falsely classify a transudative effusion as exudative. This happens when patient had already been given diuretics viz. heart failure. In such patients, the difference between serum protein and pleural fluid protein greater than 3.1 gram /dl should be considered as transudative pleural effusion. Similarly, difference between serum albumin and pleural fluid albumin ratio, if more than 1.2 gram/dl is considered as most likely transudative effusion. Classifying the pleural effusion helps in narrowing down the differential diagnosis. Rule [13] that does not require serum test is

Pf protein >2.9 g/dl

Pf cholesterol >45 mg/dl.

Pf LDH > 0.45 times upper limit of lab normal serum LDH.

Hooper et al [14] pioneered British thoracic society (BTS) guidelines to classify investigative approach of unilateral pleural effusion.

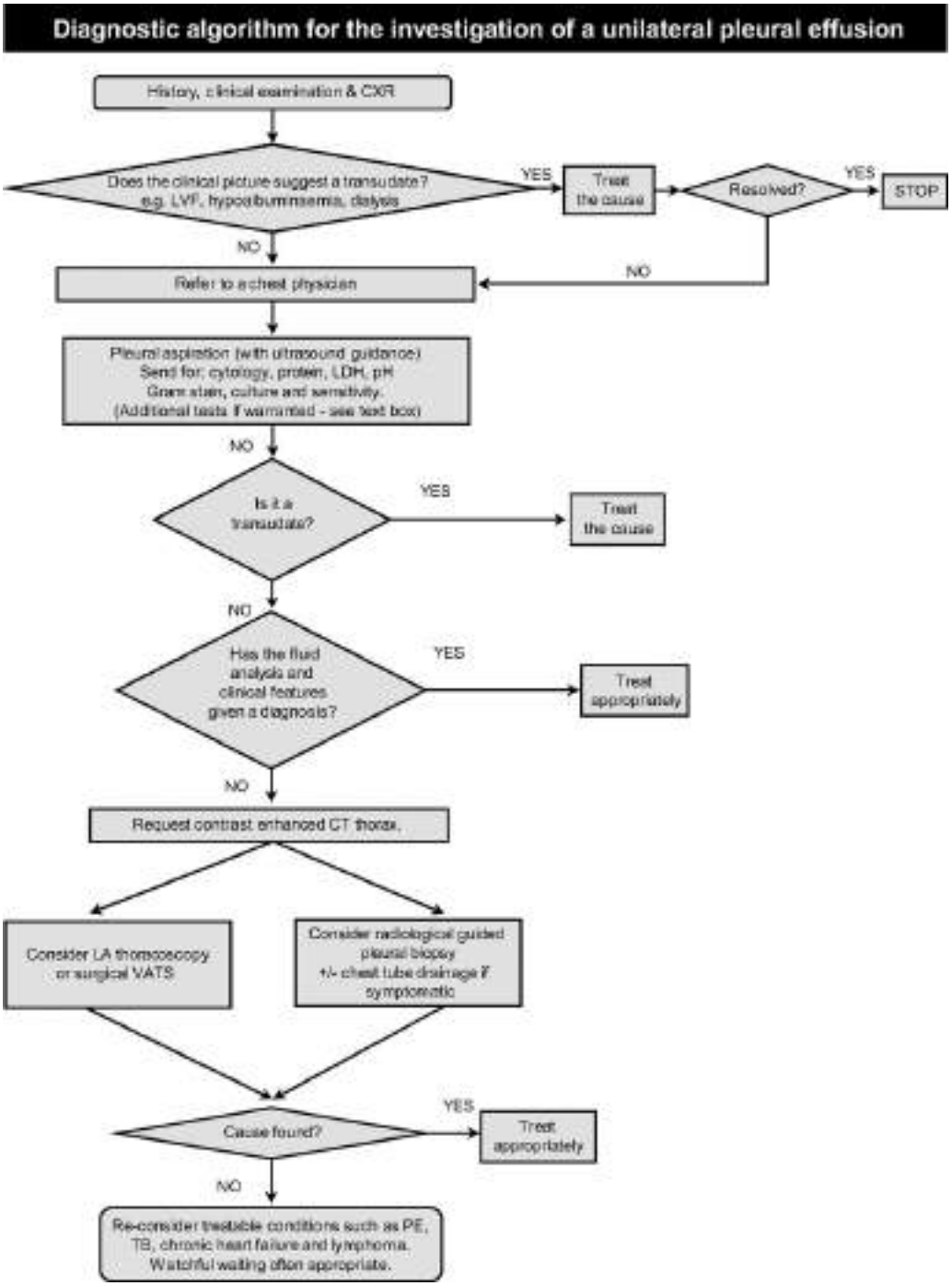
Diagnostic algorithm for the investigation of a unilateral pleural effusion
History, clinical examination & CXR
Does the clinical picture suggest a transudate? e.g. LVF, hypoalbuminaemia, dialysis
YES
Treat the cause
Resolved?
YES
STOP
NO
NO
Refer to a chest physician
Pleural aspiration (with ultrasound guidance) Send for: cytology, protein, LDH, pH Gram stain, culture and sensitivity. (Additional tests if warranted - see text box)
NO
Is it a transudate?
YES
Treat the cause
NO
Has the fluid analysis and clinical features given a diagnosis?
YES
Treat appropriately
NO
Request contrast enhanced CT thorax.
Consider LA thoracoscopy or surgical VATS
Consider radiological guided pleural biopsy +/- chest tube drainage if symptomatic
Cause found?
YES
Treat appropriately
NO
Re-consider treatable conditions such as PE, TB, chronic heart failure and lymphoma. Watchful waiting often appropriate.

Figure 1: Diagnostic Algorithm for the investigation of a unilateral pleural effusion

If the free fluid separates the lung from the chest wall by >10 mm, a therapeutic thoracocentesis [15] should be performed. Following factors indicates need of more invasive procedure than thoracocentesis (in increasing order of importance) –

-Loculated pleural fluid

-Pleural fluid pH <7.20

-Pleural fluid glucose <60mg/dl

-Positive Gram stain or culture of the pleural fluid

-Presence of gross pus in the pleural space

Causes [9] of transudative pleural effusion are:

Heart failure (left and biventricular failure), cirrhosis of liver, nephritic syndrome, hypoalbuminaemia, constrictive pericarditis, peritoneal dialysis, duropleural fistula, urinothorax, subclavian vein thrombosis, myxedema

Causes of exudative pleural effusion:

Infection – parapneumonic effusion, tuberculous pleuritis, fungal infection (coccidiodomycosis and PCP), parasitic infection (paragonimiasis, amoebiasis), viral

Infiltrative – primary lung cancer, metastatic lung cancer, mesothelioma, primary lung effusion lymphoma, Kaposi sarcoma

Inflammation – collagen vascular diseases (rheumatoid arthritis, SLE, Sjogrens syndrome, Granulomatosis with polyangitis, Churg Strauss syndrome), pancreatitis, sarcoidosis, BAPE (benign asbestos pleural effusion) post CABG

Infarction– pulmonary embolism, vasculitis syndrome

Drug induced – Nitrofurantoin, amiodarone, carbamazepine, dantrolene, dasatinib, methylsergide, Bromocriptine

Gastrointestinal disease- Esophageal perforation, intraabdominal abscesses, diaphragmatic hernia, after abdominal surgery, endoscopic variceal sclerotherapy, after liver transplant

Other causes- Iatrogenic injury, Hemothorax, Trapped lung, radiation therapy, chylothorax, yellow nail syndrome, Meig's syndrome, thoracic endometriosis, Ovarian hyperstimulation syndrome, uremia

A prospective study was carried out by Manu Mohan K et al [16] on etiological diagnosis of pleural effusion and their clinical profile. Prospective evaluation of 100 cases of pleural effusion was done. They concluded that pleural effusion is more among males (68%) and in the age group between 46 to 60 years (33%). Maximum cases (95%) were having exudative effusion. Among the exudative effusion most common cause was tuberculosis (41%).Second most common cause was

malignancy (38%). Majority of tuberculous pleural effusion (63%) was right sided whereas malignant effusion was left sided (57%). The Mantoux test, pleural fluid protein, pleural fluid ADA and age of patients had statistically significant correlation when pleural effusion due to tuberculosis and malignancy were compared.

A study was conducted by Villena et al [17] of 1,000 consecutive patients with pleural effusion in tertiary care hospital in Spain. The study mainly focused on etiology of the effusion and clinical presenting sign and symptoms of the patients. Prospective study on one thousand consecutive patients with pleural effusion, who underwent diagnostic thoracocentesis were studied for 9 years. Study concluded that the most common cause of pleural effusion was neoplasm (n = 364 patients). The most common place of origin of the tumor was the lung (n = 125), followed by the pleura (mesothelioma, n = 48). The most common histologic type was adenocarcinoma (n = 128). Tuberculosis was the second most common cause of pleural effusion (n = 155). Pleural effusion was transudative in 118 patients, mainly secondary to heart failure. Among the 42 patients who were positive for human immunodeficiency virus (HIV), the most common cause of pleural effusion was tuberculosis. Tuberculosis was also the most likely cause of pleural effusion in patients under 40 years of age. The most common causes of pleural effusion were neoplasm and tuberculosis. Tuberculosis was the most common cause in patients under 40 years of age and in those infected by HIV.

A study was done in 2009 October at Kathmandu university medical college by Dhital et al [18] to study mode of clinical presentation, causes of pleural effusion, analysis of blood and pleural fluid to make diagnosis. Retrospective data was collected of patients with pleural effusion from July 2009 to July 2007 from all the cases were taken. Altogether 100 cases diagnosed with pleural effusion by chest X-ray (posterior- anterior and lateral view) and ultrasonogram of the chest were studied. The parameters taken into account were - age group, patients' demographic profile, causes, location (unilateral, bilateral), blood hemoglobin and count, sputum profile, mantoux, chest X-ray and

ultrasound findings and pleural fluid analysis [biochemical, hematological, microbiological (culture and stain) and cytological. Age group with pleural effusion most commonly seen is 21-30 years.

Most common cause of pleural effusion was found to be tubercular effusion followed by parapneumonic effusion. In most case of tubercular parapneumonic, pleural effusion is seen on right side. Right sided effusions are also seen in malignant causes. Bilateral effusion was seen in 87.5% of the patient (7 out of 8) having underlying disease of congestive heart failure and all cases of renal disease (4 out of 4). Common mode of clinical presentation is Shortness of breath in 83% of case, cough in 67% and fever in 66% of case.

A prospective study was carried out in Ahmadabad, India by Parikh et al [19] in 2016. This study enrolled a total 100 indoor adult patients. Patients with pleural effusion as determined by clinical and or radiological means, thoracocentesis on who yield a minimum amount of fluid enough to carry out routine test were included in the study. Patients with pleural effusion with non aspirable fluid quantity decided clinically or radiologically, were excluded. Most of the patients were between the age group of 31-40 years and males (68%). Most of the patients of tuberculous effusion were from younger age group between 21-50 years. Most common symptom was chest pain (72%) followed by fever (62%). Most of cases were tuberculous (62%) followed by malignant (18%). There were 15 patients with undiagnosed pleural effusion, in which, thoracoscopic pleural biopsy was done, among them 9 patients had malignancy and 5 patients had tuberculosis pleural effusion.

A cross sectional study of 30 admitted cases with pleural effusion was conducted by Hasan et al [20]. Most common clinical presentation was respiratory distress & fever was present in 96.7%, cough in 90%. On physical examination there is diminished chest movement, sub costal recession, and decreased breath sound on the affected side. Lobar consolidation was observed in 33.3% cases, patchy opacities in 53.3% cases. Fluid levels were seen in 76.7%

cases. Straw Colored pleural fluid was seen in 56.7%, clear in 30.0%, blood stained in 13.3%.

Valdes et al [21] found about that the most frequent cause of pleural effusion was tuberculosis (25%), followed by neoplasia (22.9%) and congestive heart failure (17.9%). The cause remained uncertain in 48 cases. In the neoplastic effusion group, the most frequent locations of the primary tumor were lung (32.6%), breast (11.5%), lymphoma (10.8%), and ovary (7.5%); in 21 cases (14.3% of the neoplastic group), it was not possible to identify the primary tumor. The effusions secondary to congestive heart failure, 86% (99/115) affected the right pleura or both, and 83% of effusions secondary to pulmonary thromboembolism (15/18) affected the right side. Exudative effusions showed no preference for either side in neoplastic, tuberculous, parapneumonic or Empyema. Of the 97 bilateral effusions, 77 (79.4%) were secondary to heart failure (59, 60.8%) or neoplasm (18, 18.6%).

Porcel et al [22] conducted a retrospective analysis in Spain of three thousand consecutive thoracocentesis cases to study the etiology of pleural effusion in adults and accuracy of pleural fluid cytology and culture in malignant and infectious pleural effusion respectively. Results showed that cancer (35%), heart failure (21%), pneumonia (19%), TB (9%), abdominal surgery (4%), pericardial disease (4%) and cirrhosis (3%). In less than thirty-four age, tuberculosis is seen to be most common. Most common tumor is lung (37%) and breast (36%) and cytology has accuracy of 51% but low in case of mesothelioma and squamous cell carcinoma. Culture is positive only in 30% in case of infectious etiology. Exception is Empyema (66%). The commonest organism found is streptococcus viridians.

Arya et al [23] conducted a cross sectional study on clinic-etiological profile of patient with pleural effusion at Gwalior. Study included above 14 year of age patients with clinical and radiological evidence of pleural effusion. Sixty six percent of them exudative type of pleural effusion of these forty eight percent had tuberculosis followed by five percent had malignancy and four percent had pneumonia. Thirty five percent had transudative type of pleural effusion of this thirty

percent had hepatic involvement, twenty three percent had CCF. Acute febrile illness, nephrotic syndrome, pancreatitis, ARDS are other causes of pleural effusion.

Thoracocentesis and cytological analysis is done before biopsy and considered to be more superior as compared to biopsy. Prakash et al [24]did a retrospective study consisting 414 patients with pleural effusion that underwent both thoracocentesis and pleural biopsy. Aim of the study was to compare the cytological analysis and needle biopsy for evaluation of pleural effusion. Malignancy as the cause is established by pleural biopsy in only 45 percent whereas cytology revealed 57 percent. Proportion of patient with underlying malignancy and cytology is negative and pleural biopsy revealed malignancy is only 7.1% only. Pleural biopsy was not diagnostic in non-malignant pleural effusion except tuberculosis. Sensitivity of cytological analysis higher than the sensitivity of needle biopsy for diagnosis of malignant pleural effusion. There is limited role of pleural biopsy in pleural effusion, irrespective of malignant or non-malignant except tuberculosis.

Balachandran et al [25], classified pleural effusion on the basis of Chest radiographic finding which further depend on quantity of pleural fluid present in pleural space which was assessed by observing blunting of the posterior costophrenic angle, blunting of the lateral costophrenic sulci, meniscus sign, fluid in the fissures, loss of diaphragmatic or cardiac outline, opacification of hemithorax, mediastinal shift to the opposite side.

Table 1

CHEST X-RAY FINDINGS IN PLEURAL EFFUSION

Finding	Mild	Moderate	Massive
Obliteration of costo-phrenic angles	+	+	+
Obliteration of cardio-phrenic angles	+	+	+
Diaphragmatic dome Obscured	+/-	+	+
Cardiac border obscured	-	+	+
Meniscus sign	-	+	-
Fluid In fissure	+/-	+/-	+/-
Mediastinal shift	-	-	+
Widening of the Intercostal spaces	-	-	+
Opacification of hemi thorax	-	-	+
- Absent finding, + present findings			

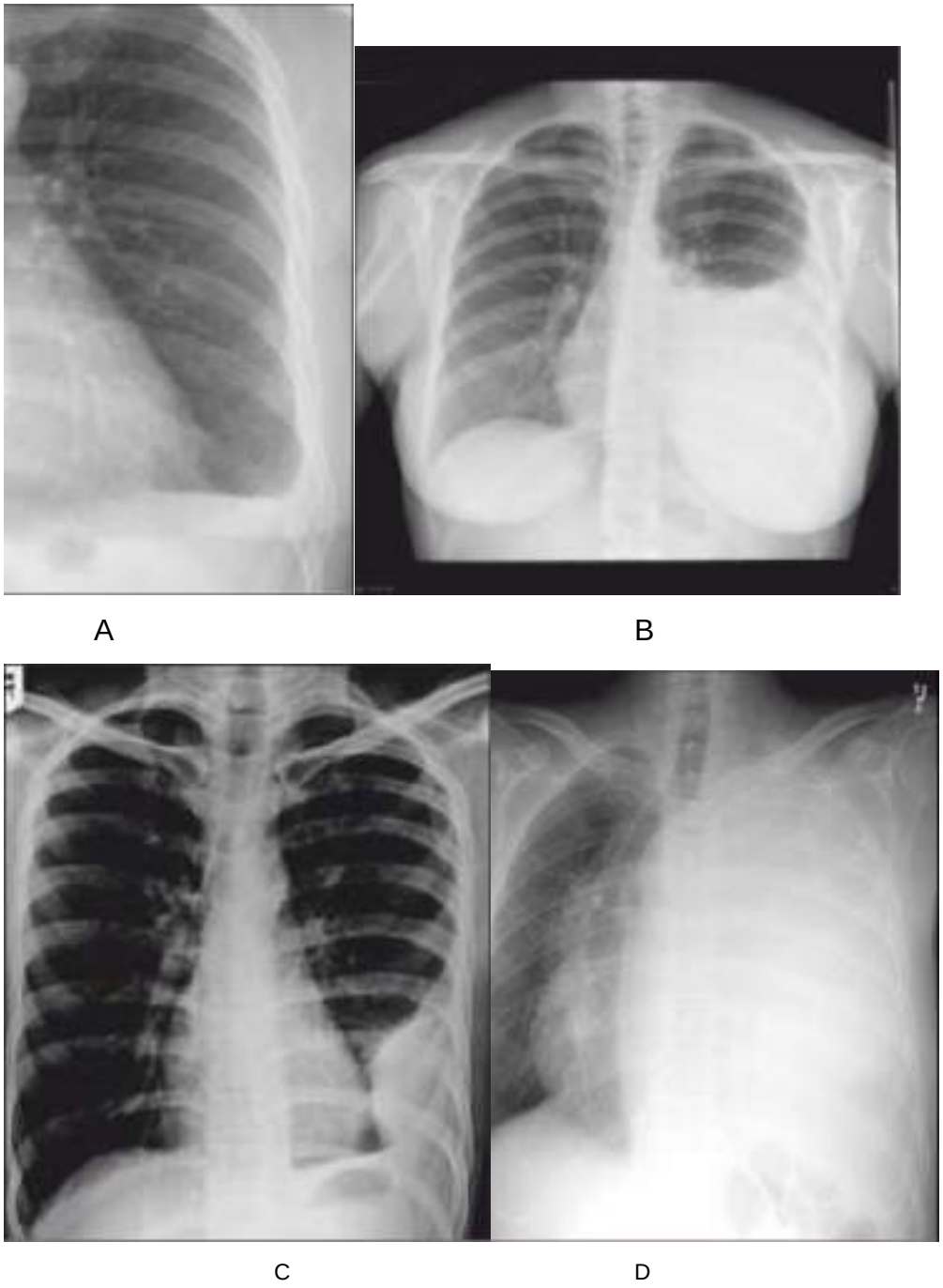

Figure 2: Chest Radiograph of pleural effusion

A) Blunting Of Left Costo-Phrenic Angle B) Meniscus Sign on Left Side C) Obliteration Of Left Costophrenic Angle, Massive Left Effusion With A Wide Pleural Based Dome Shaped Opacity Projecting Into The Lung Suggestive Of Loculated Pleural Effusion D) Massive Left Effusion

Ultrasonography chest recently gained more importance in diagnosis of pleural effusion and it is more sensitive than chest radiograph. It is

safe, there is no radiation and has the benefit of repeatability [11]. Computed tomography (CT) is usually required to quantify the fluid and to identify loculations along with the presence of parenchymal and mediastinal abnormalities which may be missed on the standard radiograph.

To ascertain the utility of cytology, a large prospective cohort study was conducted by Arnold et al [26]. 921 patients with undiagnosed unilateral pleural effusion were recruited over 8-year. All underwent thoracocentesis and pleural fluid cytological analysis. Depending on the degree of clinical suspicion of malignancy and/or initial cytological assessment, immunostaining was requested. 515 patients had a malignant pleural effusion. Overall sensitivity of fluid cytology to diagnose malignancy was 46%. The variation in sensitivity depends on cancer primary. Sensitivity of cytology to diagnose mesothelioma as per study was 6%and hematological malignancies were 40%. Cytology has a higher sensitivity (79%) for detecting adenocarcinoma compared to other cancer types. Within adenocarcinoma, there was a significant difference depending on cancer primary. Malignant pleural effusion secondary to ovarian cancer had high pickup rate. Its sensitivity was 95% which was significantly higher than breast, lung or GI malignancies, which all have similar sensitivities. Sensitivity for detection of mesothelioma on pleural fluid cytology alone was very low with 94% of patients requiring a definitive biopsy before a diagnosis could be made. There were 30 patients with malignant pleural effusion which were secondary to hematological malignancy (23 patients with lymphoma and 7 with leukemia). Less than fifty percent of these patients had clear evidence of malignancy on pleural fluid cytology.

MATERIALS AND METHODS

SOURCE OF DATA

All the patients aged more than 18 years admitted with unilateral pleural effusion in Department of Medicine and allied Specialties of Dayanand Medical College and Hospital (DMCH), Ludhiana.

METHOD OF COLLECTION OF DATA

Study Population

A prospective observation study was conducted in adult patients hospitalized with unilateral pleural effusion in DMCH, Ludhiana. This study duration was from 1st January 2019 to 31st December 2019.

Inclusion Criteria

Age ≥ 18 years.

Patients with unilateral pleural effusion admitted in department of Medicine and allied specialties.

Pleural effusion diagnosed on chest radiograph and/or ultrasonography and/or computed tomography and/or magnetic resonance imaging.

Pleural effusion amenable to tapping for diagnostic work up with or without radiological guidance.

Exclusion Criteria

Age < 18 years.

Patients with bilateral pleural effusion

Patients not giving consent for enrollment in the study.

Investigations considered necessary by the treating unit/ department were evaluated. The investigations were broadly divided into the following groups:

- Basic investigations: CBC, ESR, LFT, RFT, Urine routine, inflammatory markers like ESR
- Specific investigations: pleural fluid analysis –biochemical and/or cytopathological analysis and/or nucleic acid amplification test (NAAT) and/or culture and/or histopathology of pulmonary and/or extrapulmonary biological samples
- Radiological investigations: Chest X-ray, USG, CT scan, MRI, others

- Detailed proforma format is attached herewith with thesis plan

Test Methodology

Diagnostic criteria for each clinical diagnosis

- Pleural effusion is **exudative** [11] in nature, if one or more of the following criteria are present. Pleural effusion is **transudative** in nature, if none of the following criteria are present :-

  (1) The ratio of pleural fluid protein (Pf) to serum protein is greater than 0.5

  (2) The ratio of Pf lactate dehydrogenase (LDH) to serum LDH is greater than 0.6

  (3) The Pf LDH level is greater than two thirds of the upper limit of normal for serum LDH

- This rule [13] does not require serum LDH and protein to identify **exudative** effusions

  (1) Pf protein >2.9 g/dl, or

  (2) Pf cholesterol > 45 mg /dl, or

  (3) Pf LDH > 0.45 times upper limit of the laboratory's normal serum LDH.

- Basis of **diagnosing and grading of pleural effusion** [25] **on chest x-ray** (CXR) as mild, mod and massive were

  (1) Mild – only costophrenic angles are blunted.

  (2) Moderate- Blunting of costophrenic angle and positive meniscus sign seen and fluid level below second intercostal space.

  (3) Massive- Blunting of costophrenic angles, when fluid level is above the second intercostal space, complete opacification of hemithorax, mediastinal shift.

- Patients were diagnosed with **"Confirmed tubercular pleural effusion"**[27] if one of the following criteria was met: (1) AFB smear positive when pleural fluid was used as the source specimen, and the tuberculosis bacterium was grown in the culture medium, or the tuberculosis bacterium was detected by polymerase chain reaction (PCR); (2) In the absence of granulomatous lung disease for other

reasons, a pleural biopsy revealed a granulomatous lesion with or without caseous necrosis; and (3) The sputum culture was positive for tuberculosis bacterium and the pleural effusion improved after anti-tuberculosis treatment. "**Probable tubercular pleural effusion"** is defined as lymphocyte-predominant exudates with ADA >40 IU/L in pleural fluid in the absence of evidence of malignancy and improves after anti-tuberculosis treatment.

- **Parapneumonic effusion** [28] was diagnosed as

(1) **Typical parapneumonic** pleural effusion- glucose more than 40 mg/dl, pH more than 7.2, LDH less than 3 x upper limit normal for serum, gram's stain and culture negative

(2) **Borderline complicated** pleural effusion- Pf with pH between 7.0 and 7.20 or LDH more than 3 times upper limit normal and glucose more than 40 mg/dl, gram's stain and culture negative

(3) **Simple complicated** pleural effusion- Pf pH less than 7.0 or glucose <40 mg/dl or gram's stain or culture positive (excluding skin contaminants) but there is no loculation and no frank pus.

(4) **Complex complicated** pleural effusion-Pf with pH less than 7.0 and/or glucose<40 mg/dl or gram's stain or culture positive (excluding skin contaminants) and is multiloculated.

(5) **Simple Empyema**- frank pus present but it is single locule or free flowing

(6) **Complex Empyema**- Frank pus present along with multiloculation.

- **"Malignant effusions"** [29] were also divided into confirmed and probable categories**. "Confirmed malignant effusion"** indicated positive pleural fluid cytology or positive pleural tissue histology or confirmed malignancy at another site with radiological evidence of metastatic thoracic involvement. **"Probable malignant effusion"** indicated a documented clinical diagnosis based on a suggestive radiological and clinical course and the absence of an alternative cause.
- A diagnosis of "**definite tuberculous empyema"**[30] was defined as if frank puss on pleural aspiration with pleural fluid smear and/or

culture was positive for acid-fact bacilli(AFB)/Mycobacterium tuberculosis on two or more occasions.**"Probable tuberculous empyema"** was defined as empyema in patients in who had radiological evidence of active pulmonary tuberculosis on CT scans (nodular consolidation in apical segments/tree-in-bud appearance/mediastinal lymphadenopathy with central necrosis) or concomitant positive sputum smears for AFB.

- **TST** [31] is considered **positive** if:

-At least 5 mm of induration in high-risk persons like HIV infection, close contact with an active TB patient, abnormal chest radiograph with fibrotic changes, organ transplant recipient, and another form of immunosuppressant (taking the equivalent of > 15 mg/day of prednisone, TNF antagonists, other biologics).

-Induration of 10 mm or greater in persons with above baseline risk of reactivation like Chronic kidney disease on dialysis, silicosis, diabetes mellitus, malignancy, underweight status, jejunoileal bypass, gastrectomy, injection drug abuse, age less than 4-years old, foreign-born from countries with high incidence of TB who immigrated within the past 5 years, and residents or workers in prisons, jails, healthcare facilities, and homeless or refugee shelters.

-Induration of 15 mm or greater in low-risk patients like 4-years and older with the low likelihood of TB infection.

Outcome

The outcome studied was variables like diagnosis at time of discharge/ discharge on request (DOR) / death / discharge against medical advice (DAMA), length of stay in hospital, clinical/laboratory/treatment profile of admitted patients, details of pre-admission workup and treatment outside, surgical Intervention(s); if any and follow-up post-discharge at months: 2; 4 and 6; wherever feasible

Statistical Analysis

The data was analyzed statistically using appropriate methodology. Data was described in terms of range; mean ±standard deviation (± SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. All statistical calculations were done

using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

OBSERVATION & RESULTS

Over a period of 1 year (January 2019 to December 2019), 116 patients aged ≥ 18 years were admitted with unilateral pleural effusion in department of Medicine and allied specialties of Dayanand Medical College and Hospital (DMCH), Ludhiana as per the inclusion criteria.

Out of 116 admitted patients, maximum number of patients (n=46, 39.6%) were in age group of 41-60 year. Mean age was 51.5± 17.2 years (Table 2, Figure 3).

Out of 116 patients studied, there were 81 (69.8%) male patients and 35 (30.2%) female patients in our study. Male to female ratio was 2.3:1 (Table 3, Figure 4). Most common age group among males and females was 60-70 years and 51-60 years respectively (Table 4, Figure 5).Most of the population was from urban area 59.5 % (Table 5, Figure 6)

Average duration of symptoms before coming to our institute was 21 days. The main symptoms were shortness of breath (n=65, 56%), fever (n=62*, 53.4%; *including 23 patients with evening rise in temperature), cough (n=61, 52.5%), chest pain (n=41, 35.3%), anorexia (n=40, 34.5%), weight loss (n=22,18.9%), pain abdomen (n=16, 13.7%), night sweats (n=13, 11.2%), vomiting (n=12, 10.3%), fatiguability or generalized weakness (n=6, 5.1%), Nausea (n=5, 4.3%), altered sensorium and abdominal distension (n=4, 3.4%), burning micturition and jaundice (n=3, 2.5%), palpitations (n=2, 1.7%), hemoptysis (n=2, 1.7%), constipation (n=2, 1.7%), lower back ache (n=2, 1.7%), loose stools (n=1, 0.9%), increased frequency of micturition (n=1, 0.9%), decreased urine output (n=1, 0.9%), headache (n=1, 0.9%), seizures (n=1, 0.9%), quadriparesis (n=1, 0.9%) and hemiparesis (n=1, 0.9%). Hence, the most common symptoms observed in our study were shortness of breath (56%), followed by fever (53.4%), cough (52.5%) and chest pain (35.3%) (Table 6, Figure 7).

Fever was continuous in 15 (13%) patients and intermittent in 47 (41%) patients. It was associated with chills & rigors in 49 (42%)

patients. Shortness of breath was modified medical research council (MMRC) grade 3 in 36 patients (31%).

It was observed that right sided (n=25, 21.6%) chest pain was more common than left sided (n=16, 13.7%). Character of chest pain was sharp in most of the patients (n=41, 35.3%). Pain increases with inspiration and decreases with expiration in 39 patients (33.6%).Pain was insidious in onset in 33 patients (28.4%), progressive in 35 patients (30.2%) and moderate in severity in 20 patients (17.2%).

There were 36 patients (31%) with history of diabetes mellitus (DM), 34 (29.3%) patients with hypertension (HTN), 25 (21.6%) patients with coronary artery disease (CAD), 19 patients (16.4%) with past history of tuberculosis (TB), 18 (15.5%) patients with chronic kidney disease (CKD), 12 (10.2%) patients with malignancy, 11 (9.5%) patients with hypothyroidism, 8 (6.9%) patients with chronic liver disease (CLD), 8 (6.9%) patients with chronic obstructive pulmonary disease (COPD), 4 (3.4%) patients with old cerebrovascular accident (CVA), 3 (2.6%) patients with bronchial asthma, 2 (1.7%) patients with corpulmonale and 1 (0.9%) patient each with interstitial lung disease (ILD), seizure disorder, people living with HIV (PLHIV), inflammatory bowel disease (IBD) and valvular heart disease (Table 7, Figure 8).

Among the 19 patients (16.4%) with past history of TB, 15 patients (12.9%) had pulmonary TB, 2 patients (12.9%) had abdominal TB, 1 patient (0.9%) had disseminated TB and 1 patient (0.9%) had skeletal TB in the past.

On general physical examination, sensorium was normal in 109 (93.9%) patients. 7 patients were found to be drowsy because of hepatic encephalopathy (n=4; 3.4%), Uremic encephalopathy (n=2; 1.7%) and brain metastasis (n=1; 0.9%). Pallor (n=72, 62.10%), pitting edema (n=24, 20.7%) and lymphadenopathy (LAP) (n=7, 5.1%) were the most common physical signs present (Table 8). Out of 7, 4 patients had cervical LAP, 2 had axillary LAP and 1 had supraclavicular LAP.

It was observed that reduced respiratory movements, decreased tactile vocal fremitus, diminished breath sound, stony dull note on percussion on the affected side were the most common (n=116, 100%)

findings present on chest examination. 21 (18.1 %) patients had crepitation which were unilateral. 6 (5.1%) patients had had bronchial breath sound (Table 9, Figure 9).

Chest radiograph showed right sided pleural effusion in 67 (57.8%) patients and left sided in 49 (42.2%) patients (Table 37). It was observed that there were a greater number of patients with mild pleural effusion (n=64*, 55.2%; *include 20 patients with secondary pleural effusion) as compared to moderate (n=42, 36.2%) and severe (n=10, 8.6%) (Table10, Figure 10).

Other chest radiograph findings were consolidation (n=21, 18.1%), cavitatory changes (n=4, 3.4%) and air fluid level (AFL)(n=2, 1.7%).

Ultrasonography (USG) of chest was done in 52 patients (44.8%). Unilateral pleural effusion was seen in all of 52 patients (44.8%), septation was present in 14 patients (12.1%), consolidation in 5 patients (4.3%) and pleural thickening in 1 patient (0.9%) (Table 11, Figure 11).

Diagnostic aspiration was done in all cases (n=116, 100%). Gross appearance of pleural fluid sample in 53 patients (45.7%) was straw colored. 24 patients (20.7%) had blood stained, 20 patients (17.2%) had clear, 12 patients (10.3%) had yellow and turbid and 7 patients (6%) had pus coloured pleural fluid sample gross appearance. There was no chylous pleural effusion observed in our study (Table 12, Figure 12).

Of all the patients admitted (n=116), 99 (85.3%) patients had exudative and 17 (12.1%) patients had transudative (14.7%) (Table 13, Figure 13) nature of pleural effusion.

Among the 99 patients with exudative pleural effusion, 53 (45.7%) patients had tuberculous pleural effusion, 15 (12.9%) patients had parapneumonic pleural effusion, 12 (10.3%) patients had malignancy, 7 (6.1%) patients had empyema, 4 (3.4%) patients had pleural effusion secondary to acute pancreatitis, 3 (2.6%) patients had Hemothorax, 1 (0.9%) patient had pleural effusion reactionary to

abdominal surgery and 4 (3.4%) patients had unknown cause (Table 14, Figure 14).

There were 13 patients who were confirmed case of tuberculous pleural effusion and 40 patients who were probable case of tuberculous pleural effusion.

Among the 15 patients with parapneumonic effusion, 4 had typical parapneumonic effusion, 4 had simple complicated parapneumonic effusion and 7 had complex complicated pleural effusion. Out of 7 patients with empyema, only 1 patient had tubercular empyema and rest were bacterial.

Out of 12 patients with malignant pleural effusion, 12 were confirmed and 3 were probable case of malignant pleural effusion.

Among 6 patients with empyema, 2 were simple and 4 were complex empyema.

Among 17 patients with transudative and pseudo-exudative pleural effusion, 5 (4.3%) patient had heart failure with reduced ejection fraction (HFrEF) along with chronic kidney disease (CKD),2 (1.7%) patients had anemiaandhypoproteinemia,2 (1.7%) patients had CKD, 1 (0.9%) patient had chronic liver disease (CLD), 1 (0.9%) patient had hypothyroidism, 1 (0.9%)patient had HFrEF, 1 (0.9%) had heart failure with normal ejection fraction (HFnEF), 1 (0.9%) patient had corpulmonale, 1 (0.9%) patient had HFrEF along with acute kidney injury (AKI) and hypoproteinemia and 2 (1.7%) patients had unknown cause(Table 15, Figure 15).

Among the patients with tuberculous pleural effusion, Pleural fluid analysis showed exudative nature in all (n=53) the patients. Lymphocytic predominance was seen in 52 (98.1% among its own group) patients. ADA was more than 40 IU/dL in all 53patients (100% among its own group). Pleural fluid cartridge based nucleic acid amplification test (CBNAAT) was positive in 9 patients (16.9% among its own group) and line probe assay (LPA) was positive in 2 patients (3.7% among its own group). Sputum acid fast bacilli (AFB) was positive in 3 patients (5.6%) and sputum CBNAAT was positive in 2 patients (3.7% among its own group) (Table 16, Figure 16). Other

supportive evidences found were positive mantoux test in 15 patients (28.3% among its own group) and past history of TB was present in 13 patients (25.0% among its own group). 12 patients (22.6%among its own group) had radiological suspicion of TB.

The primary of malignancy in patients with malignant pleural effusion was carcinoma lung (n=3, 2.6%), carcinoma breast (n=3, 2.6%), renal cell carcinoma (n=2, 1.7%), carcinoma ovary (n=, 0.9%), carcinoma pancreas (n=1, 0.9%), carcinoma gall bladder (n=1, 0.9%) and unknown primary (n=1, 0.9%) (Table17, Figure 17). Out of 12 patients with malignant pleural effusion, 9 were confirmed case and 3 were probable case (Table 14, Figure 14). Among confirmed malignant pleural effusion, 1 was histopathologically proven, 7 were cytologically proven and 4 were radiologically proven (Table 18, Figure 18). Malignant cell from pleural fluid sample was positive in 7 patients which constitutes 58.3% of malignant pleural effusion cases.

90.6% (n=48) of straw-colored pleural fluid sample had tuberculous etiology. All the malignant pleural effusion had hemorrhagic pleural fluid sample (Table 19, Figure 19).

Pleural fluid protein to serum protein ratio is maximum in case of tuberculous pleural effusion (mean 0.9 ± 0.9) followed by parapneumonic effusion (mean 0.7 ± 0.1) followed by malignancy (mean 0.6 ± 0.2) followed by other causes (Table 20, Figure 20).

Pleural fluid adenosine deaminase (ADA) analysis was done in 113 (97.4%) patients. Mean ± standard deviation (SD) value of the study population was 95.9 ± 92.5 IU/L. Mean ± SD ADA values in tuberculous, parapneumonic and malignant pleural effusion was 140.9 ± 84.7 IU/L, 94.7 ± 118.5 IU/L and 37.6 ± 79.5 IU/L respectively (Table 20, Figure 20).

Out of 113 patients (97.4%) whose pleural fluid ADA was done, ADA greater than 40 IU/L was present most commonly in tuberculous pleural effusion (n=52,44.8%) followed by empyema (n=4, 3.4%), parapneumonic (n=8, 6.9%), malignant pleural effusion (n=3, 2.6%), unknown (n=1, 0.9%)and HFrEF and CKD (n=1, 0.9%) (Table 21). It was observed that out of 53 patients with tubercular pleural effusion, 52

patients had ADA greater than 40 IU/L. Tuberculous pleural effusion (98.1%) had ADA value >40IU/L (p value 0.001) whereas most of malignant pleural effusion (75%) had ADA value <40 IU/L (p value 0.01) (Table 22, Figure 21).

Cutoff value of >40 IU/L of ADA had sensitivity of 75.4%, specificity of 97.7%, PPV of 98.1% and NPV of 71.7% for diagnosing tuberculous pleural effusion (Table 23).

Mean pleural fluid glucose value was 109.9 mg/dl. Minimum observed value for pleural fluid glucose was seen in empyema (mean 37.5 ± 54.4 mg/dl) and parapneumonic effusion (mean 67.40 ± 74.2 mg/dl) (Table 24). Pleural fluid glucose level less than 40 mg/dl was present in 14 patients (12.1%), among which 8 patients (6.9%) had parapneumonic effusion, 5 patients (4.3%) had empyema and 1 patient (0.9%) had tubercular empyema (Table 25).

Among all etiologies parapneumonic effusion had highest LDH value (mean 4843.5 ± 9066.6) (Table 20). Higher value of LDH specifically pleural fluid LDH to serum LDH ratio of more than 2 was seen in patients with tuberculous pleural effusion (n=27, 23.3%), parapneumonic effusion (n=13, 11.2%), malignant pleural effusion (n=9, 7.7%) and empyema (n=7, 6.0%) (Table26). All 7 patients with empyema had pleural fluid LDH ratio more than 2.

Pleural fluid pH analysis was done in 106 patients. Maximum number of patients (n=65, 61%) had pH between 7.2- 7.4. pH less than 7 was seen in 10 patients, 4 (3.4%) were empyema and 6 (5.2%) were parapneumonic (Table 27).

Pleural fluid analysis showed lymphocyte predominance in 90 patients (77.6%) whereas neutrophil predominance in 26 patients (22.4%).Lymphocytic predominance was seen in tuberculous pleural effusion (n=52, 98.1% among its own group), malignant pleural effusion (n=12, 100% among its own group), HFrEF and CKD (n=5, 100% among its own group), pancreatic (n=4, 100% among its own group) and other transudative causes. It was observed that neutrophil predominance was seen in patients with parapneumonic effusion (n=14, 93.3% among its own group), empyema (n=5, 100% among its

own group) and hemothorax (n=3, 100% among its own group)(Table 28).

Pleural fluid L/N ratio of >0.75 increases the specificity for diagnosing tuberculous pleuritis. Tuberculous pleural effusion (n=52; 98% among its own group), malignant pleural effusion (n=12; 100% among its own group), pancreatic pleural effusion (n=4; 100% among its own group), pleural effusion reactionary to abdominal surgery (n=1; 100% among its own group), and unknown cause (n=2; 50% among its own group) had pleural fluid L/N ratio of >0.75 in our study (Table 29). Sensitivity and specificity of Pf L/N ratio of >0.75 to diagnose tuberculous pleural effusion was 56.52% and 95.83% respectively (Table 30, Figure 22).

There were 58 patients who had both ADA >40 and L/N ratio >0.75. It includes 52 patients (89.6% among its own group) with tuberculous pleural effusion, 3 patients (5.2% among its own group) with malignant pleural effusion, 1 patient (1.7% among its own group) with bacterial empyema, 1 patient (1.7% among its own group)with tubercular empyema and 1 patient with HFrEF and CKD (1.7% among its own group) (Table 31, Figure 23). When ADA & L/N ratio were analyzed simultaneously, it was found that 98% (n=52) of patients with ADA >40 and L/N ratio >0.75 had tubercular etiology. The sensitivity and the specificity to diagnose tuberculous pleural effusion rise up to 89.7% and 98.3% respectively (Table 32, Figure 24).

Mean pleural fluid Total Leucocytes Count (TLC) was 2015.6 ± 3088.2 cells/mm^3. Mean TLC of tuberculous pleural effusion was 2399.3± 3381.4 cells/mm^3. Mean TLC of parapneumonic effusion was 2516.7 ± 4571.6 cells/mm^3 and that of empyema was 3435.5±4489.4 cells/mm^3. Mean TLC count of malignant pleural effusion was 1487.5 ± 1587.8 cells/mm^3 (Table 33). It was observed that 2 patients (1.7%) had pleural fluid TLC more than 10,000 among which 1 patient (0.9%) had empyema and 1 patient (0.9%) had parapneumonic effusion (Table 34).

Pleural fluid culture revealed growth of organism in 13 cases out of 17 cases of complicated parapneumonic effusion and empyema

cases. Pleural fluid routine aerobic and anaerobic culture was done in all the patients. Staphylococcus aureus was the most commonly (n=4, 3.4%) isolated organism from pleural fluid. Out of these 4 patients, 2 had Methicillin Resistant Staphylococcus Aureus (MRSA). Other organisms isolated were Burkholderia (n=1, 0.9%), Pseudomonas (n=1, 0.9%), Klebsiella (n=1, 0.9%), Sphingomonas (n=1, 0.9%) and Vancomycin resistant enterococcus (VRE) (n=1, 0.9%), Candida (n=1, 0.9%). There was growth of contaminant like Staphylococcus epidermidis and Staphylococcus hemolyticus in 3 patients (2.6%) (Table 35, Figure 25).

Pleural fluid CBNAAT was performed in 112 patients (96.6%). Out of which 8.0% (n=9/112) were positive and 91.9% (n=103/112) were negative (Table 36, Figure 26). Pleural fluid LPA was performed in 7 patients (6.0%) among which 2 were positive (Table 16, Figure 16).

Malignant cell from pleural fluid sample was positive in 7 patients which constitutes 58.3% of malignant pleural effusion cases (Table 18, Figure 18).

The haematological and biochemical profile of all the patients was observed at the time of admission and discharge. In our study, anemia (Hb<12 gm/dL) and severe anemia (Hb<8 gm/dL) was seen in 74 (63.8%) and 11 (9.5%) patients respectively. Leucopenia (Total leucocyte count < 4000/cu.mm) was not seen in any patient whereas leucocytosis (Total leucocyte count > 12000/cu.mm) was seen in 38 (32.8%) patients. Thrombocytopenia (platelet count below 150000) was seen in 13 (11.2%) patients (Table 37, Figure 27).

Biochemical profile including renal function tests and liver function tests were studied to assess organ dysfunction. A total bilirubin ≥ 1.5 mg/dL and SGOT and SGPT ≥ 50 IU/L were considered for assessing hepatic dysfunction. Hyperbilirubinemia with a total bilirubin ≥ 1.5 mg/dL was seen in 11 (9.5%) patients and transaminitis i.e., SGOT and SGPT ≥ 50 IU/L was seen in 23 (19.8%) and 21 (18.1%) patients respectively. 45 (38.8%) patients having raised ALP >

125 IU and 81 (69.8%) patients with serum albumin <3.5 gm/dL were also considered to be having hepatic dysfunction (Table 38, Figure 28). 23 (19.8%) patients were having a serum creatinine ≥ 1.5 mg/dL and considered to be having renal dysfunction. Electrolyte disturbances i.e., hyponatremia (sodium <135 mmol/L) and hypernatremia (sodium >145 mmol/L) were seen in 42 (36.2%) and 6 (5.2%) patients respectively. Hypokalemia (potassium <3.5 mmol/L) and hyperkalemia (potassium >5.0 mmol/L) were seen in 14 (12.1%) and 17 (14.7%) patients respectively (Table 39, Figure 29).

Sputum analysis culture and sensitivity revealed growth in 9 cases which showed Pseudomonas in 5 patients (4.3%), Klebsiella in 2 patients (1.7%), Klebsiella as well as fungal growth in 1 patient (0.9%),1 patient (0.9%) had both Klebsiella and Acinetobacter growth and 1 patient (0.9%) had Acinetobacter along with E. Coli and fungal growth (Table 40, Figure 30). Sputum CBNAAT was positive in two patients only (Table 16, Figure 16).

Chest radiograph showed right sided pleural effusion in 67 (57.8%) patients and left sided in 49 (42.2%) patients (Table 41). It was observed that tubercular pleural effusion (n=33, 63.3% among its own group), malignant pleural effusion (n=7%, 58.3% among its own group), parapneumonic effusion (n=10, 66.6% among its own group), empyema (n=4, 66.6% among its own group), hemothorax (n=2, 66.6% among its own group) and effusion secondary to surgery (n=1, 100% among its own group) was more common on right side. Pancreatic effusion is more common on left side. All the four patients with pancreatic effusion had left sided effusion (Table 41).

Out of 64 patients with mild pleural effusion, 29 were tubercular in etiology whereas out of 10 patients with massive pleural effusion 5 were malignant (Table 42, Figure 31).

USG abdomen was done in 17 patients (14.7%).Free fluid in abdomen in 11 patients (9.5%), renal parenchymal change (RPC) in 10 patients (8.6%), hepatomegaly in 9patients (7.8%), splenomegaly in 7 patients (6.0%) and liver echotexture changes in 4 patients (3.4%) (Table 43, Figure 32).

Computed tomography (CT) chest was done in 77 patients (66.4%), mediastinal lymphadenopathy (LAP) in 12 patients (10.3%), consolidation in 12 patients (10.3%), cavitatory lesion in 7 (6.0%) patients (single cavity in 4 patients and multiple in 3 patients), nodular shadow in 6 (5.2%) patients, bronchiectasis and/or fibrosis in 5 (4.3%) patients, lung mass in 3 (2.6%) patients, pleural thickening in 3 (2.6%) patients, ground glass haziness (GGO) in 3 (2.6%) patients, milliary mottling in 2 (1.7%)patients, AFL in 1 (0.9%) patient, pulmonary thromboembolism (PTE) in 1 (0.9%) patient (Table 44, Figure 33). Probable etiology based on CT chest was tubercular in 17 (14.7%) patients, malignant in 7 (6.0%) patients and non-tubercular pathology in 23 (19.8%) patients (Table 45, Figure 33).

Echocardiography was done 42 (36.2%) patients, 9 (7.8%) patients had ejection fraction (EF) less than 60%, 34 (23.3%) patients had normal EF. Regional wall motion abnormality (RWMA) was present was present in 3 (2.6%) patients and 5 (4.3%) patients had global hypokinesia. 10 (8.6%) patients had left ventricular hypertrophy (LVH) and 7 (6.03%) had LV diastolic dysfunction. There were 2 (1.7%) patients with mitral valve calcification with dilated left atria (LA). Right ventricular (RV) dysfunction along with pulmonary arterial hypertension (PAH) was present in 5 (4.3%) patients. Etiology of RV dysfunction was coronary artery disease (CAD) in 2 (1.7%) patients, secondary to mitral annular calcification (MAC) in 2 (1.7%) patients and COPD with corpulmonale in 1 (0.9%) patient (Table 46, Figure 34).

Bronchoscopy was performed in 1 (0.9%) patient which showed growth occluding the right lower lobe bronchus suggestive of carcinoma lung.

Biopsy was performed in 6(5.2%) patients. Biopsy from lung was performed in 3 (2.6%) patients, which was suggestive of adenocarcinoma in 1 (0.9%) patient, lung abscess in1 (0.9%) patient, no significant abnormality was detected in 1(0.9%) patient. Pleural biopsy was done in 1 (0.9%) patient which s/o granuloma and was tuberculosis polymerase chain reaction (TB- PCR) positive. Liver biopsy was done in 1 (0.9%) patient which was suggestive of

metastatic deposit likely from adenocarcinoma lung. Cervical lymph node biopsy was performed in 1 (0.9%) patient which was suggestive of reactive hyperplasia (Table 47).

Medical management of patients with unilateral pleural effusion include 55 (47.4%) patients with anti-tubercular treatment (ATT), 35 (30.2%) patients were given Intravenous (IV) antibiotic, 14 (12.1%) patients with supportive treatment, 12 (10.3%) patients with decongestive therapy, 6 (5.2%) patients with antifungal and 4 (3.4%) patients with chemotherapy (Table 48, Figure 35).

Therapeutic aspiration was done in 26 cases (22.4%). These patients had moderate to severe respiratory distress. These patients include 10 (8.6%) with malignant pleural effusion, 9 (7.7%) with tuberculous pleural effusion, 2 (1.7%) with effusion of unknown etiology, 1 (0.9%) with HFrEF and CKD, 1 (0.9%) with CKD, 1 (0.9%) with HFrEF, 1 (0.9%) with corpulmonale and 1 (0.9%) with CLD (Table 49, Figure 36).

Intercostal drainage tube (ICD) insertion was done in 40 patients (34.9%). Among these 40 patients, 11 (9.5%) had tuberculous pleural effusion, 11 (9.5%) had parapneumonic effusion, 6 (5.2%) had malignant pleural effusion, 6 (5.2%) had empyema, 3 (2.6%) had hemothorax, 1 (0.9%) had tubercular empyema and 2 (1.7%) were of unknown etiology (Table 50, Figure 37)

In our study Streptokinase (Stk) was inserted in 14 (12.1%) patients in view of incompletely drained pleural fluid (Table 53). It includes 3 patients with empyema (50% among its own group), 7 patients with parapneumonic effusion (46.6% among its own group) and 4 patients with tuberculous pleural effusion (7.5% among its own group) (Table 51).

Video-assisted thoracoscopic surgery (VATS) and broncho-pleural fistula closure and decortication was done in one (0.9%) patient in our study (Table 52, Figure 38).

Mean age of patients with tubercular pleural effusion was 47.9 year and that of malignant and parapneumonic pleural effusion was 52.7 years & 56.6 years respectively (Table 51).Hence, patients with

tubercular etiology of pleural effusion were comparatively younger as compared to patients with malignant and parapneumonic pleural effusion (Table 53, Figure 39).

Out of the 116 admitted patients, 98 (84.5%) patients were discharged, 18 (15.5%) patients went DAMA (discharged against medical advice) and no mortality was observed during the course of hospitalization (Table 54, Figure 40).

Out of 18 patients who went DAMA, 14 had exudative and 4 had transudative nature of pleural effusion. Among the exudative group, 5 (4.3%) were parapneumonic, 3 (2.6%) were tubercular, 3 (2.6%) were malignant, 2 (1.7%) were unknown etiology and1 (0.9%) was empyema. Among transudative group, 1 (0.9%) patient had CKD in, 1 (0.9%) patient had HFrEF along with AKI and hypoproteinemia, 1 (0.9%) patient had anemia and hypoproteinemia and 1 (0.9%) patient unknown etiology (Table 55).

On the other hand, those who were discharged, most common etiology was tubercular (n=50, 43.1%), followed by parapneumonic (n=15, 12.9%), malignant (n=9, 7.6%), empyema (n=5, 4.3%), HFrEF and CKD (n=5, 4.3%), pancreatic (n=4, 3.4%), hemothorax (n=3,2.6%), unknown (n=2, 1.7%), reactionary to abdominal surgery (n=1, 0.9%) , tubercular empyema (n=1, 0.9%), CKD (n=1, 0.9%), anemia and hypoproteinemia (n=1, 0.9%), HFnEF(n=1, 0.9%), HFrEF(n=1, 0.9%), hypothyroidism (n=1, 0.9%), CLD (n=1, 0.9%), corpulmonale (n=1, 0.9%) and unknown transudative (n=1, 0.9%)

The average duration of stay in hospital was 11.3 days. The average duration of stay in ward was 8.6 days and in ICU was 2.7 days. 15 (12.9%) patients required ICU care during their course of hospitalization. Etiology of pleural effusion among patients requiring ICU care was tuberculous pleural effusion (n=8, 8.9%), parapneumonic (n=2, 1.7%), malignant (n=1, 0.9%), pancreatitis (n=1, 0.9%), hemothorax (n=1, 0.9%), HFrEF with AKI and hypoproteinemia (n=1, 0.9%) and corpulmonale (n=1, 0.9%) (Table 56).

113 patients were followed up at 2 months, out of which 62.8% (n=71/113) showed improvement in constitutional symptoms whereas

88.2% (n=90/102) showed improvement at 4 months of follow up and 89.5% (n=77/86) patients showed improvement at 6 months of follow up. Most common cause of mortality was malignancy followed by parapneumonic effusion and empyema (Table 57).

51 patients of tubercular pleural effusion were followed up at 2 months, 4 months and43 patients were followed at 6 months and it was found that 68.6% (n=35/51), 92.2% (n=47/51) and 97.6% (n=41/42) showed improvement respectively. 2 (3.8% among its own group) patients showed ATT induced hepatitis. 8 (15.1% among its own group) patients were readmitted with fever which on evaluation was found to be because of empyema (n=4, 7.5% among its own group), pneumonia (n=2, 3.7% among its own group), pott spine (n=1, 1.9% among its own group) and urinary tract infection (n=1, 1.9% among its own group). 2 (3.8% among its own group) patients required repeat therapeutic tap. One patient (1.9% among its own group) developed hydro-pneumothorax. 2 patients (3.7% among its own group) stopped ATT on follow up. One patient (1.9% among its own group) was later diagnosed with carcinoma lung.

Among 12 cases of malignant pleural effusion, 5 (41.7% among its own group) patients died at 2 months of follow up and all these patients had non pulmonary malignancy. 4 (33.3% among its own group) patients died at 4 months follow up and all of them also had non pulmonary malignancy. One patient (8.3% among its own group) underwent decortications, one patient (8.3% among its own group) required pleurodesis, one patient (8.3% among its own group) required chest tube insertion in view of hydro-pneumothorax and one (8.3% among its own group) patient required therapeutic tap on follow up.

Out of 20 patients with parapneumonic effusion and empyema followed at 2 months, 50% (n=10/20) showed improvement. 100 % (n=15/15) showed improvement at 4 months of follow up and 100 % (n=11/11) showed improvement at 6 months of follow up.

Table 2

Age Distribution of Patients

	N	Minimum	Maximum	Mean	SD
Age (Years)	116	17	90	51.53	17.212

Age group (Years)	No. of patients	Percentage
< 20	4	3.4%
21-40	28	24.2%
41-60	46	39.6%
>60	38	32.7%
Total	116	100.0%

N- Number of Patients, %-Percentage, SD- Standard Deviation

Figure 3

Age Distribution of Patients

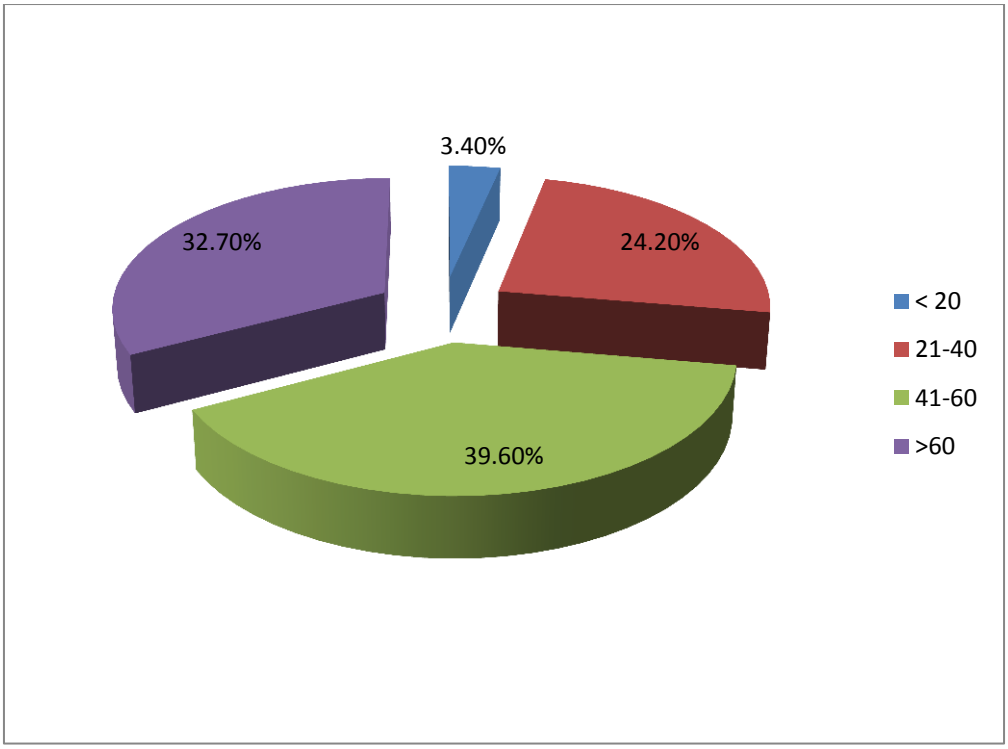

Table 3

Sex distribution of patients

Gender	No. of patients	Percentage
M	81	69.8%
F	35	30.2%
Total	116	100.0%

F-Female, M-Male

Figure 4

Sex distribution of patients

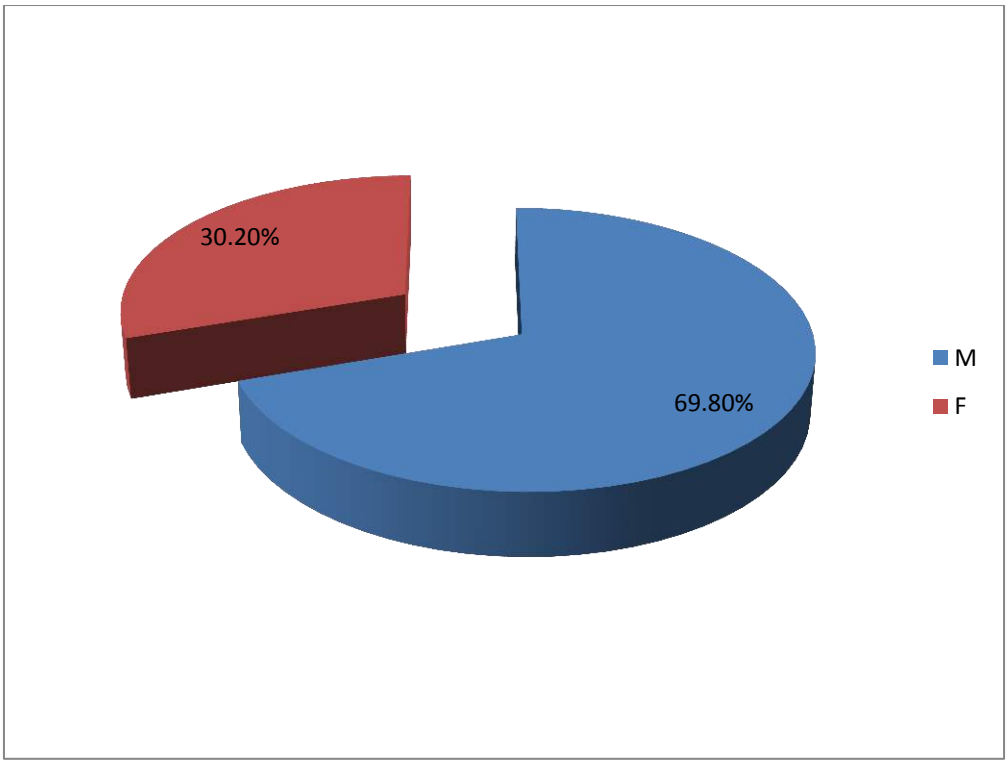

Table 4

Age Distribution with Sex

	Gender: F/M				Total
Age group (Years)	F		M		
< 20	1	2.9%	3	3.7%	4
21-30	5	14.3%	12	14.8%	17
31-40	3	8.6%	8	9.9%	11
41-50	8	22.9%	10	12.3%	18
51-60	11	31.4%	17	21.0%	28
61-70	3	8.6%	23	28.4%	26
>70	4	11.4%	8	9.9%	12
Total	35	100.0%	81	100.0%	116

F-Female, M-Male, %-Percentage

Figure 5

Age Distribution with Sex

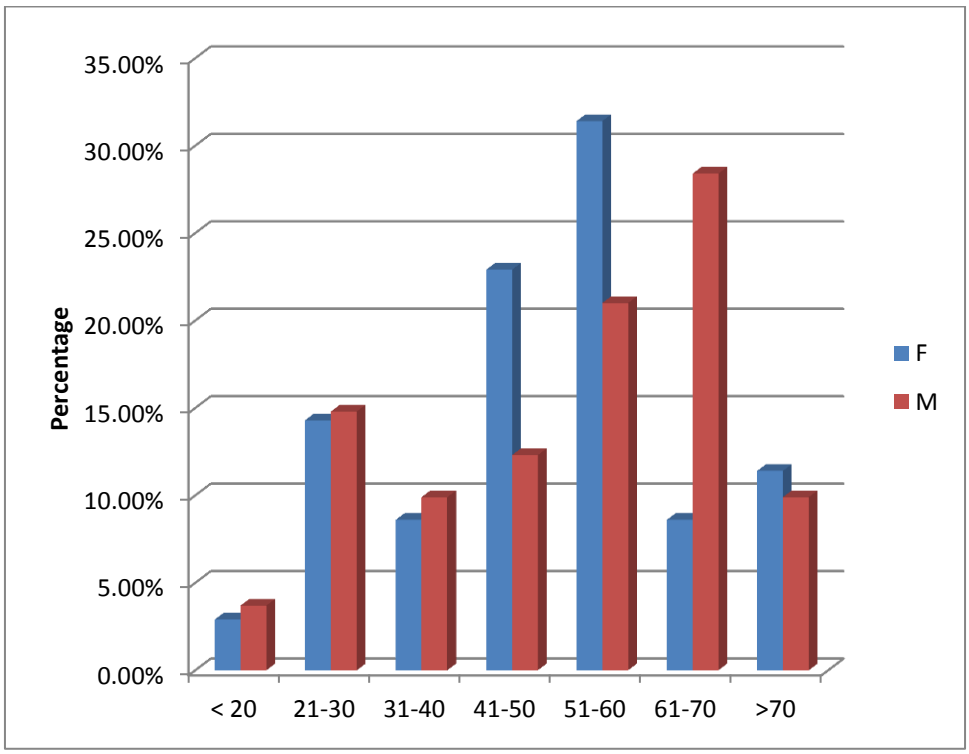

Table 5

Geographic distribution of population

Urban/Rural	No. of cases	Percentage
Urban	69	59.5%
Rural	47	40.5%
Total	116	100.0%

%- percentage

Figure 6

Geographic distribution of population

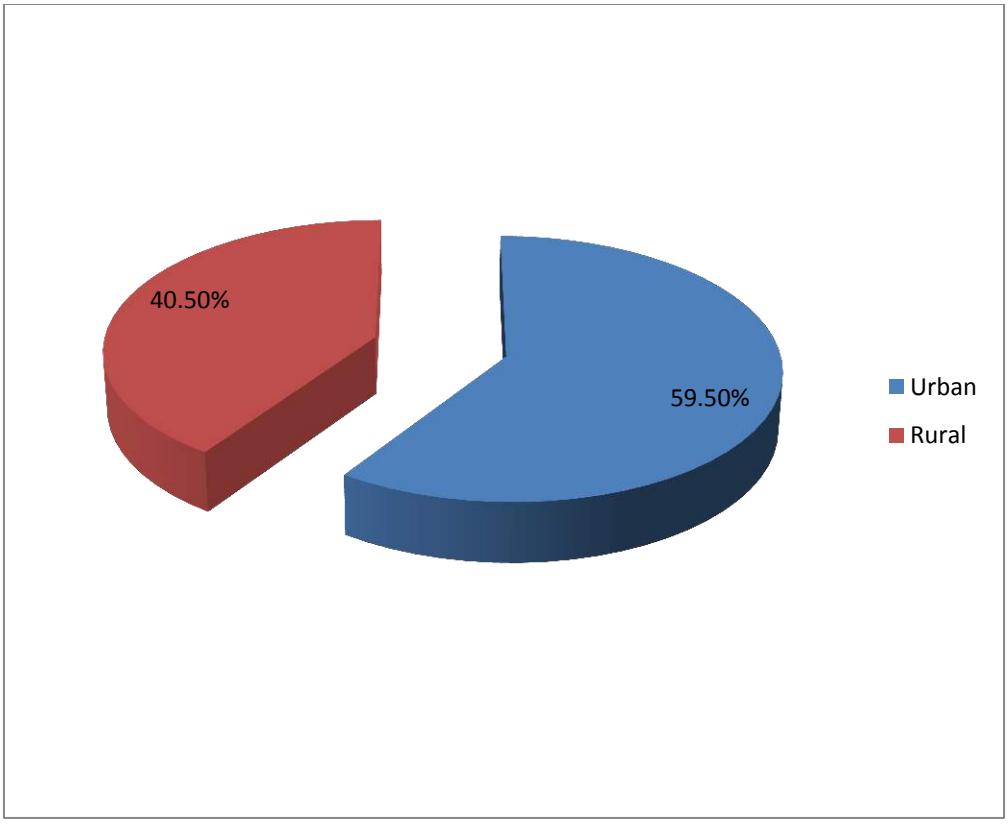

Table 6

Distribution of patients based on presenting complaints

	Presenting Complaints	No of Patients	Percentage
Constitutional Symptoms	Fever	62	53.4%
	Continuous	15	12.9%
	Intermittent	47	40.5%
	Chills & Rigors	49	42.2%
	Anorexia	40	34.5%
	Evening Rise	23	19.8%
	Weight Loss	22	19.0%
	Night Sweats	13	11.2%
	Fatigability	6	5.2%
Respiratory Symptoms	Shortness of Breath	65	56.0%
	MMRC Grade 1	51	44.0%
	MMRC Grade 2	15	12.9%
	MMRC Grade 3	36	31.0%
	MMRC Grade 4	14	12.1%
	Cough	61	52.6%
	Chest Pain	41	35.3%
	Site		
	Left	16	13.8%
	Right	25	21.6%
	Character		
	Sharp	41	35.3%
	Onset		
	Insidious	33	28.4%
	Sudden	5	4.3%
	Course		
	Progressive	35	30.2%

	Severity		
	Mild	13	11.2%
	Moderate	20	17.2%
	Severe	1	0.9%
	Inc with Inspiration & Cough and Dec with Expiration	39	33.6%
	Hemoptysis	2	1.7%
Others	Pain Abdomen	16	13.8%
	Vomiting	12	10.3%
	Nausea	5	4.3%
	Abdominal Distension	4	3.4%
	Altered Sensorium	4	3.4%
	Jaundice	3	2.6%
	Burning Micturition	3	2.6%
	Palpitations	2	1.7%
	Constipation	2	1.7%
	Lower Back Ache	2	1.7%
	Loose Stools	1	0.9%
	Increased Frequency of Micturition	1	0.9%
	Decreased Urine Output	1	0.9%
	Headache	1	0.9%
	Seizures	1	0.9%
	Quadriparesis	1	0.9%
	Hemiparesis	1	0.9%

MMRC-Modified Medical Research Council, %-Percentage, Inc-increase, Dec- Decrease

Figure 7

Distribution of patients based on presenting complaints

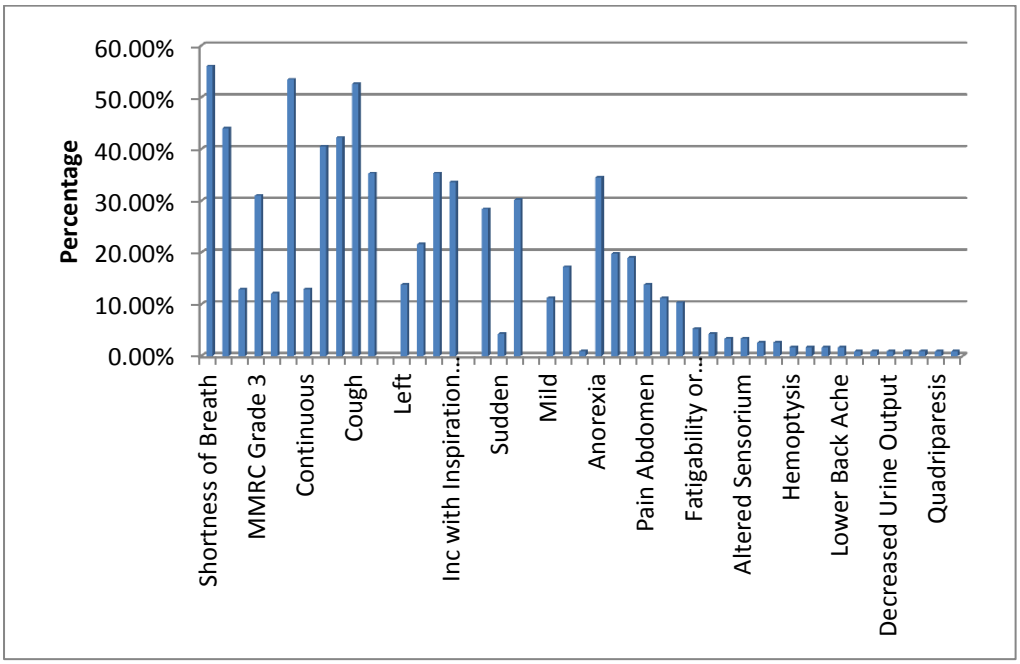

Table 7

Distribution of Subjects According to Past History

Co-morbidities	No. of cases	Percentage
DM	36	31.0%
HTN	34	29.3%
CAD	25	21.6%
TB	19	16.4
Pulmonary TB	15	12.9%
Abdominal TB	2	1.7%
Disseminated TB	1	0.9%
Other	1	0.9%
CKD	18	15.5%
Malignancy	12	10.3%
Hypothyroidism	11	9.5%
CLD	8	6.9%
COPD	8	6.9%
CVA	4	3.4%
BA	3	2.6%
Corpulmonale	2	1.7%
ILD	1	0.9%
OSA	1	0.9%
Valvular heart disease	1	0.9%
Coeliac disease	1	0.9%
Seizure disorder	1	0.9%
PLHIV	1	0.9%
IBD	1	0.9%

PLHIV- people living with Human immunodeficiency virus, IBD- inflammatory bowel disease, BA- bronchial asthma, OSA- Obstructive sleep apnoea, ILD- interstitial lung disease, COPD- chronic obstructive pulmonary disease, CVA- cerebrovascular accident, CAD- coronary artery disease, CLD- chronic liver disease, DM- diabetes mellitus, HTN- hypertension, CKD- chronic kidney disease TB- Tuberculosis

Figure 8

Distribution of Subjects According to Past History

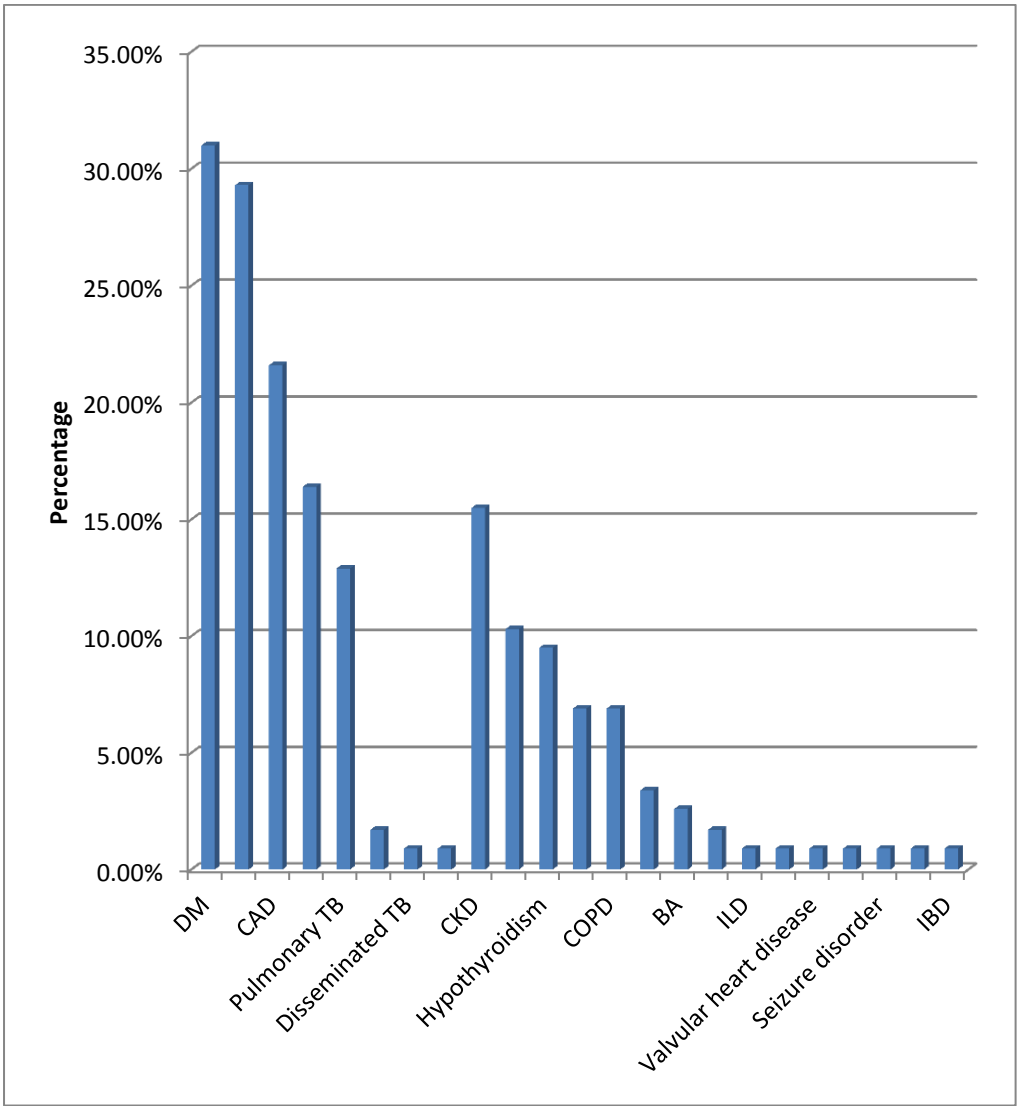

Table 8

General Physical Examination

GPE	No. of cases	Percentage
Pallor	72	62.1%
Pitting Edema	24	20.7%
Contralateral Deviation of Trachea	7	6.0%
Lymphadenopathy Cervical Axillary Supraclavicular	7 4 2 1	6.0%
Sensorium – Drowsy Hepatic encephalopathy Uremic encephalopathy Brain metastasis	7 4 2 1	6.0%
Icterus	6	5.2%
JVP Raised	5	4.3%
Clubbing	2	1.7%
Skin: Rash	1	0.9%

LAP- Lymphadenopathy, GPE- general physical examination, JVP- jugular venous pressure

Table 9

Distribution of Subjects According to Respiratory Examination

	Respiratory Finding on pathological side	No of Patients	%
Inspection	Reduced respiratory movements	116	100%
Palpation	Decreased TVF	116	100%
Percussion	Stony Dull on Percussion	116	100%
Auscultation	Decreased Breath Sounds	116	100%
	Crepitations	21	18%
	Bronchial Breath Sound	6	5%
	Tubular	4	3%
	Amphoric	2	2%
	Cavernous	0	0%

TVF- tactile vocal fremitus, %-percentage

Figure 9

Distribution of Subjects According to Respiratory Examination

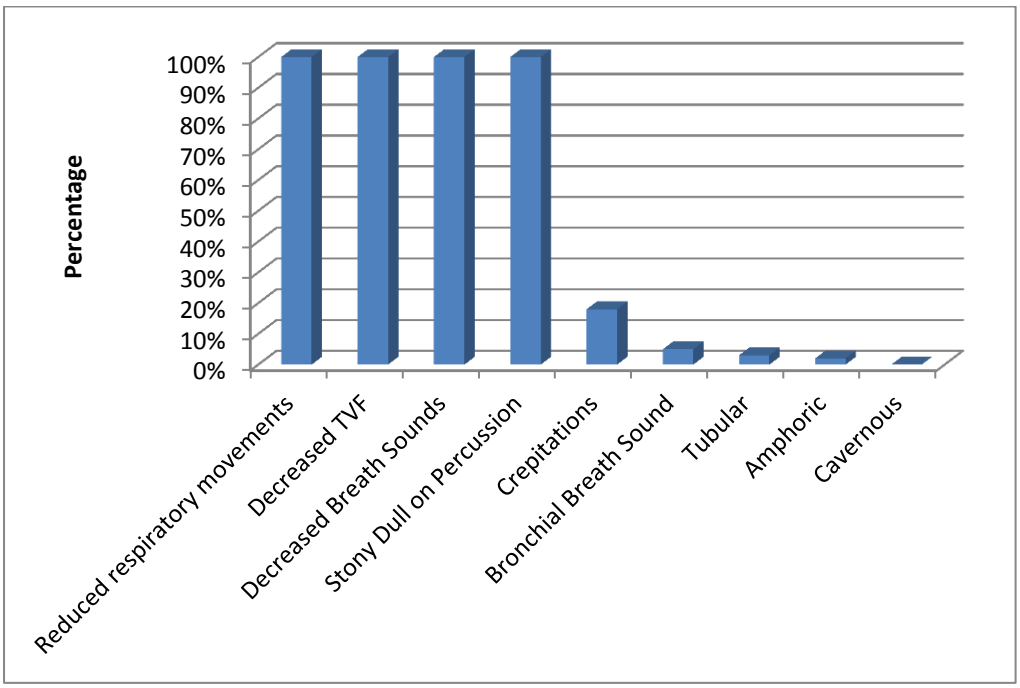

Table 10

Distribution of Subjects According to Chest Radiograph Findings

Chest Radiograph Findings	N	%
Unilateral Pleural Effusion	116	100%
Mild	64*	55.2%
Moderate	42	36.2%
Severe	10	8.6%
Laterality of Pleural Effusion		
Left	49	42.2%
Right	67	57.8%
Consolidation	21	18.1%
Cavitatory Lesion	4	3.4%
Air Fluid Level	2	1.7%

%-Percentage; *include 20 patients with secondary pleural effusion,

N- Number of patients

Figure 10

Distribution of Subjects According to Chest Radiograph Findings

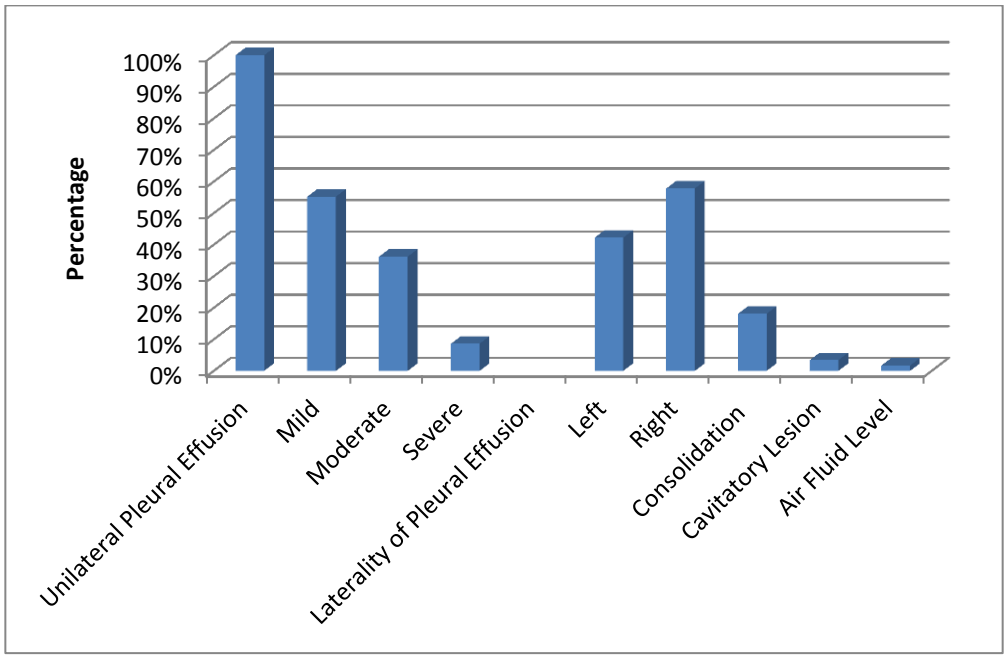

Table 11

Distribution of Subjects according to Ultrasonography Chest findings

USG findings	No. of cases	%
Unilateral Pleural Effusion	52	44.8%
Septation	14	12.1%
Consolidation	5	4.3%
Pleural thickening	1	0.9%

USG –Ultrasonography,%-Percentage

Figure 11

Distribution of Subjects according to Ultrasonography Chest findings

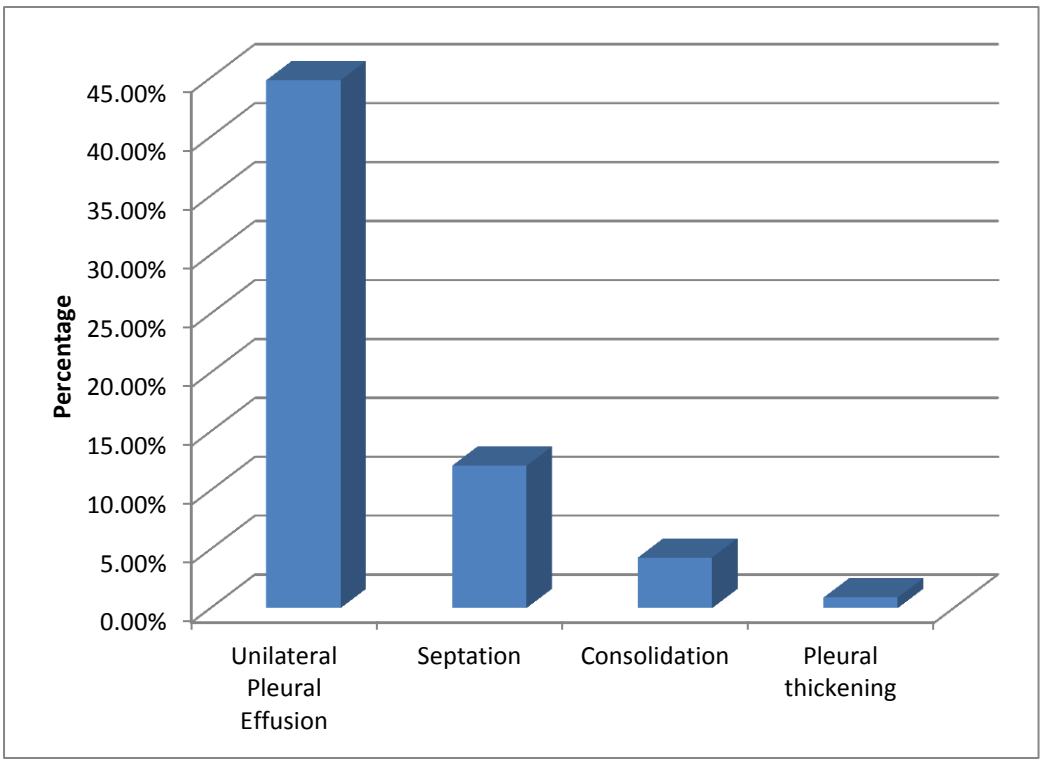

Table 12

Distribution of Subjects According to Gross appearance of pleural fluid

Gross appearance	No. of cases	Percentage
Straw	53	45.7%
Hemorrhagic	24	20.7%
Clear	20	17.2%
Yellow and turbid	12	10.3%
Pus	7	6.0%
Total	116	100.0%

%- Percentage

Figure 12

Distribution of Subjects According to Gross appearance of pleural fluid

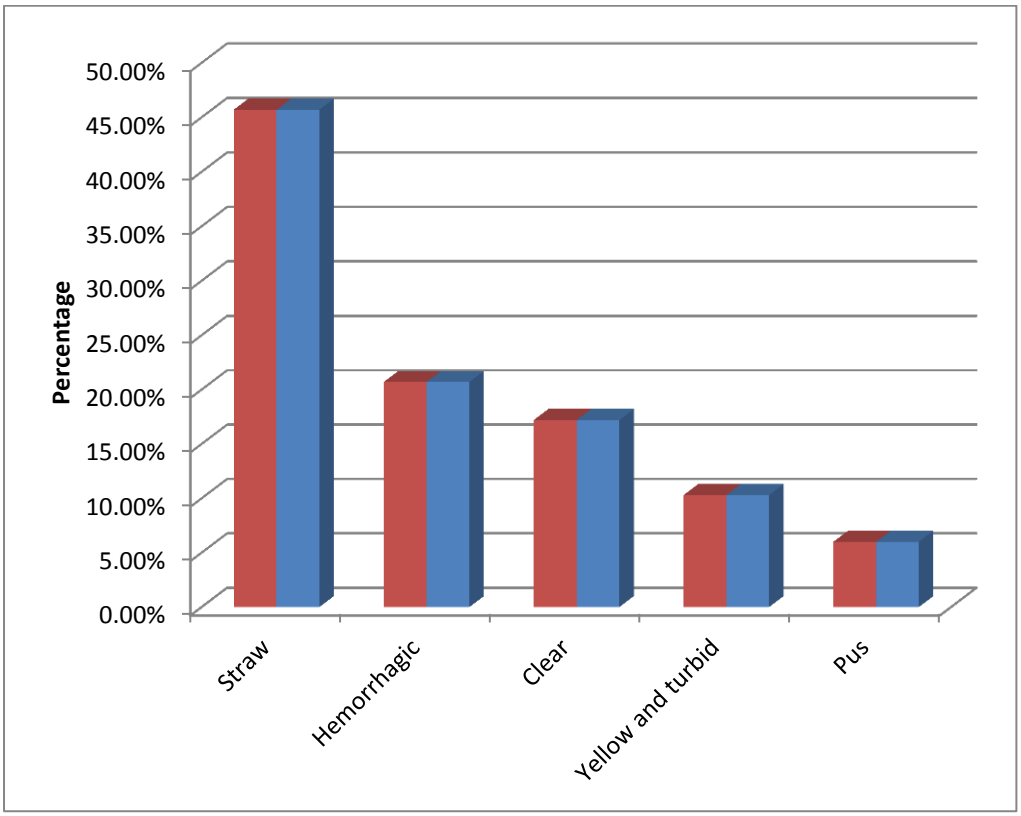

Table 13

Nature of pleural effusion

Nature of pleural effusion	No. of Patients	Percentage
Exudative	99	85.3%
Transudative	17	14.7%
Total	116	100.0%

Figure 13

Nature of pleural effusion

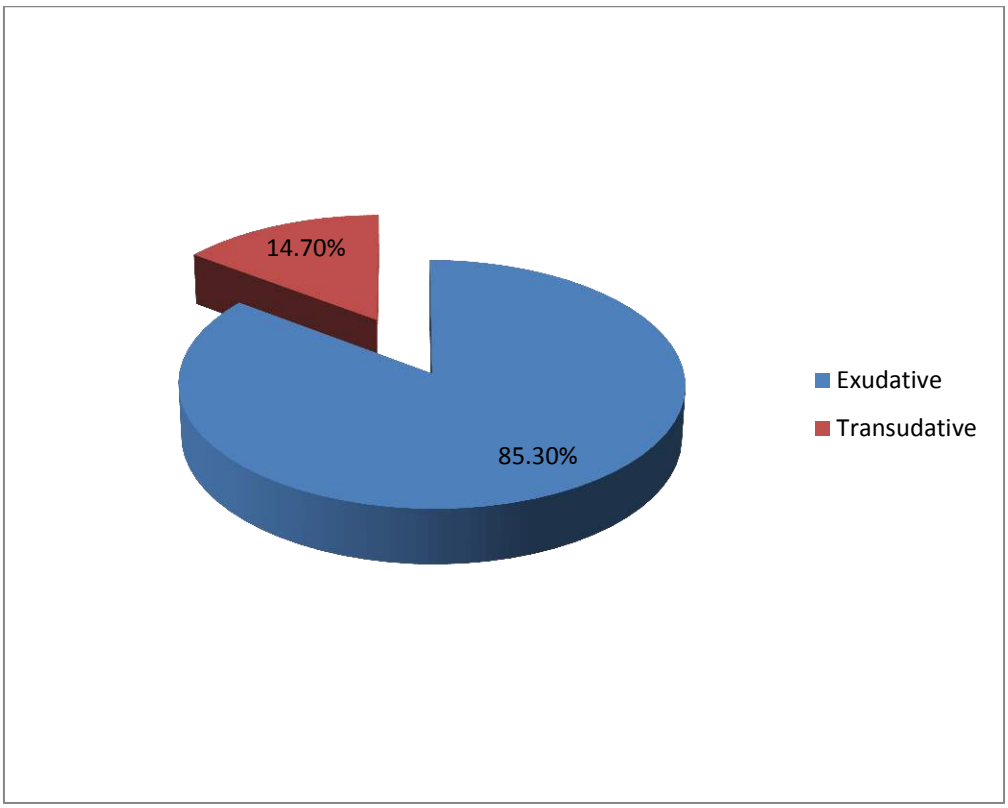

Table 14

Etiology of Exudative Pleural Effusion

Exudative Pleural Effusion Etiology	N	Percentage
Tubercular	53	45.7%
Confirmed	13	11.2%
Probable	40	34.5%
Parapneumonic	15	12.9%
Typical Parapneumonic	4	3.4%
Simple Complicated Parapneumonic	4	3.4%
Complex complicated Parapneumonic	7	6.0%
Malignancy	12	10.3%
Confirmed	9	7.8%
Probable	3	2.6%
Empyema	6	5.2%
Simple Empyema	2	1.7%
Complex Empyema	4	3.4%
Pancreatic	4	3.4%
Unknown	4	3.4%
Hemothorax	3	2.6%
Reactionary to Abdominal Surgery	1	0.9%
Tubercular Empyema	1	0.9%
Non exudative	17	14.6%
Total	116	100.0%

N-No. Of Patients, %- percentage

Figure 14

Etiology of Exudative Pleural Effusion

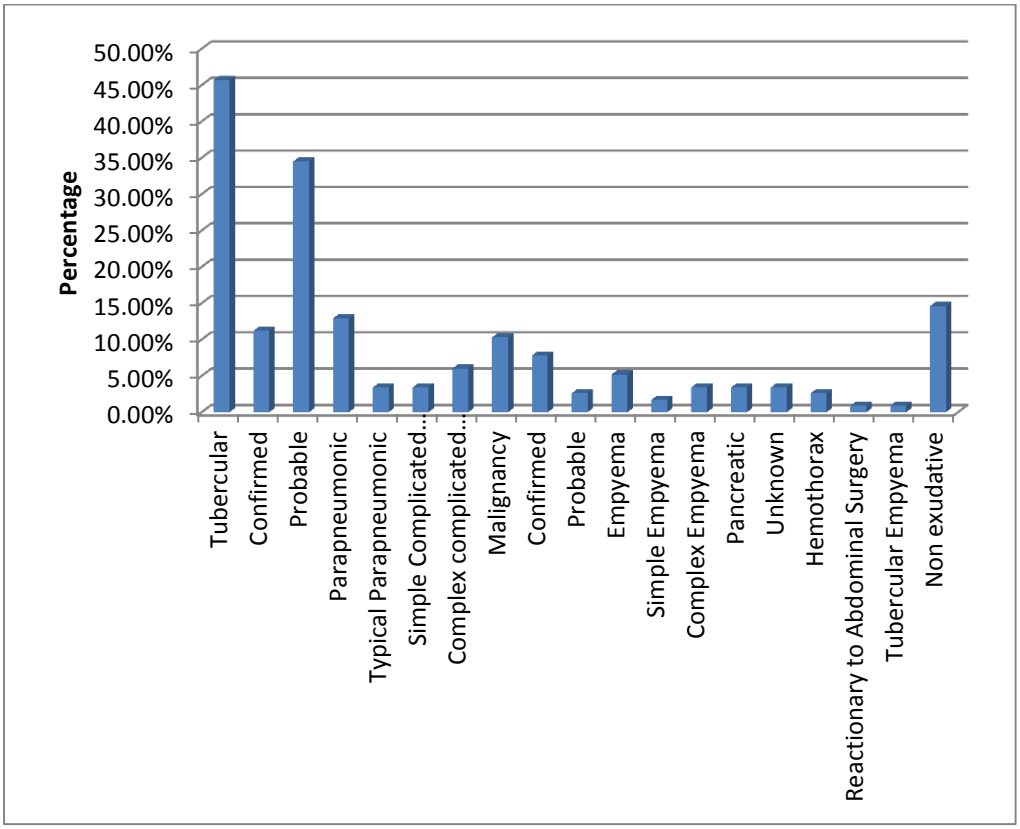

Table 15

Etiology of Transudative Pleural Effusion

Transudative Pleural Effusion Etiology	No. of Patients	Percentage
HFrEF and CKD	5	4.3%
CKD	2	1.7%
Anemia and Hypoproteinemia	2	1.7%
HFnEF	1	0.9%
HFrEF	1	0.9%
Corpulmonale	1	0.9%
CLD	1	0.9%
Hypothyroidism	1	0.9%
HFrEF, AKI and Hypoproteinemia	1	0.9%
Unknown	2	1.7%
Non Transudative	99	85.3%
Total	116	100.0%

HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury, %-percentage

Figure 15

Etiology of Transudative Pleural Effusion

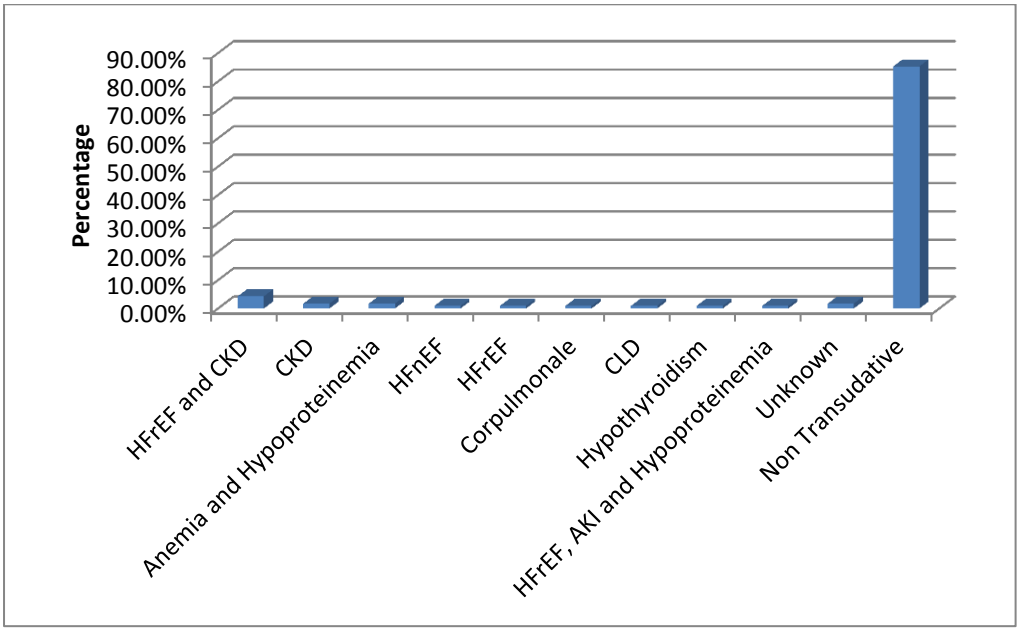

Table 16

Distribution of Patients with Tuberculous Pleural Effusion as per Diagnostic Criteria Fulfilled

Diagnostic Criteria	Number of Patients with Tuberculous Pleural Effusion	Percentage
Pf CBNAAT Positive	9	16.9%
Pf LPA Positive	2	3.7%
Sputum AFB Positive	3	5.6%
Sputum CBNAAT	2	3.7%
Pf Exudative with Lymphocytic predominance with ADA >40	52	98.1%

Pf-pleural fluid, CBNAAT – Cartridge based nucleic acid amplification test, AFB- Acid fast bacilli, LPA- Line probe assay, ADA- Adenosine deaminase

Figure 16

Distribution of Patients with Tuberculous Pleural Effusion as per Diagnostic Criteria Fulfilled

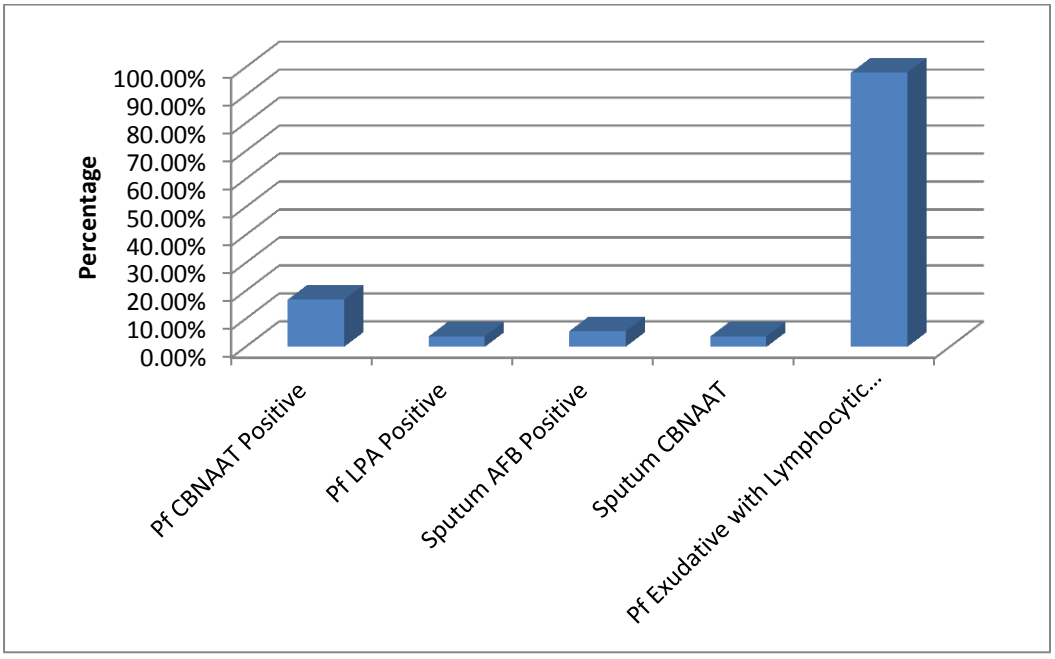

Table 17

Distribution of Subjects with Malignant Pleural Effusion According to Primary Site of Tumor

Primary Site of Malignancy	No. of cases	Percentage
Absent	104	86.2%
Pulmonary malignancy	3	2.6%
Non-Pulmonary Malignancy	8	6.9%
Breast	3	2.6%
RCC	2	1.7%
Pancreas	1	0.9%
GB	1	0.9%
Ovary	1	0.9%
Unknown	1	0.9%
Total	116	100.0%

RCC- Renal cell carcinoma, GB- Gall Bladder, %- percentage

Figure 17

Distribution of Subjects with Malignant Pleural Effusion According to Primary Site of Tumor

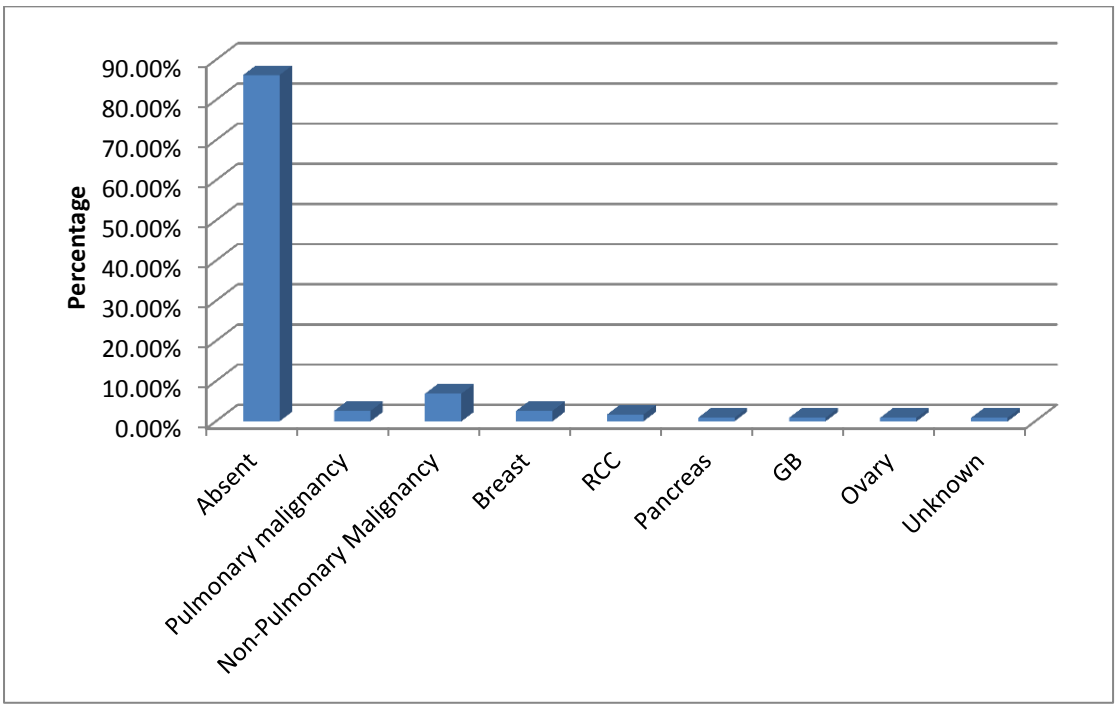

Table 18

Basis of diagnosing malignant pleural effusion

Malignancy	N	%	Confirmed case			Probable case
			Radiological evidence	Positive M-Cell cytology	Positive Histopa-thology	
Breast	3	25.0%	1	2	0	0
RCC	2	16.6%	1	0	0	1
Pancreas	1	8.3%	0	0	0	1
Lung	3	25.0%	2	3	1	0
GB	1	8.3%	0	0	0	1
Ovary	1	8.3%	0	1	0	0
Unknown	1	8.3%	0	1	0	0
Total	12	100%	4	7	1	3

M-Cells- Malignant cells, RCC- Renal cell carcinoma, GB- Gall Bladder, %- percentage

Figure 18

Basis of diagnosing malignant pleural effusion

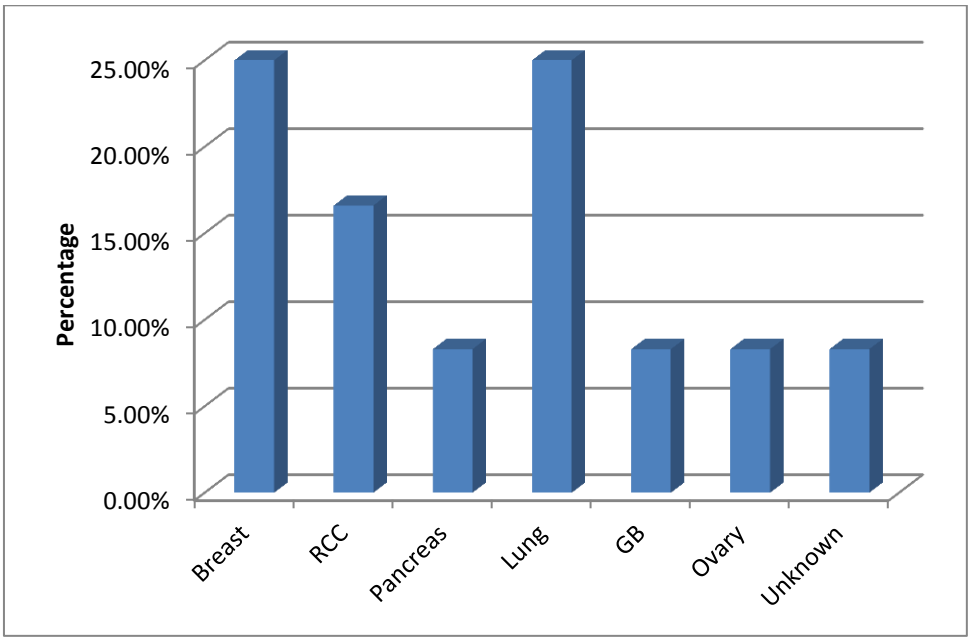

Table 19

Association between Etiology and gross

Gross appearance	Etiology								Total	Chi-square value	p-value
	Tubercular		Para-pneumonic		Malignant		Others				
	N	%	N	%	N	%	N	%			
Straw	48	90.6%	1	6.7%	0	0.0%	4	11.1%	53	214.67	0.001
Yellow and turbid	0	0.0%	12	80.0%	0	0.0%	0	0.0%	12		
Hemorr-hagic	4	7.6%	1	6.7%	12	100.0%	7	19.4%	24		
Pus	0	0.0%	0	0.0%	0	0.0%	7	19.4%	7		
Clear	1	1.9%	1	6.7%	0	0.0%	18	50.0%	20		
Total	53	100%	15	100%	12	100%	36	100%	116		

N-No. Of Patients, %-Percentage

Figure 19

Association between Etiology and gross

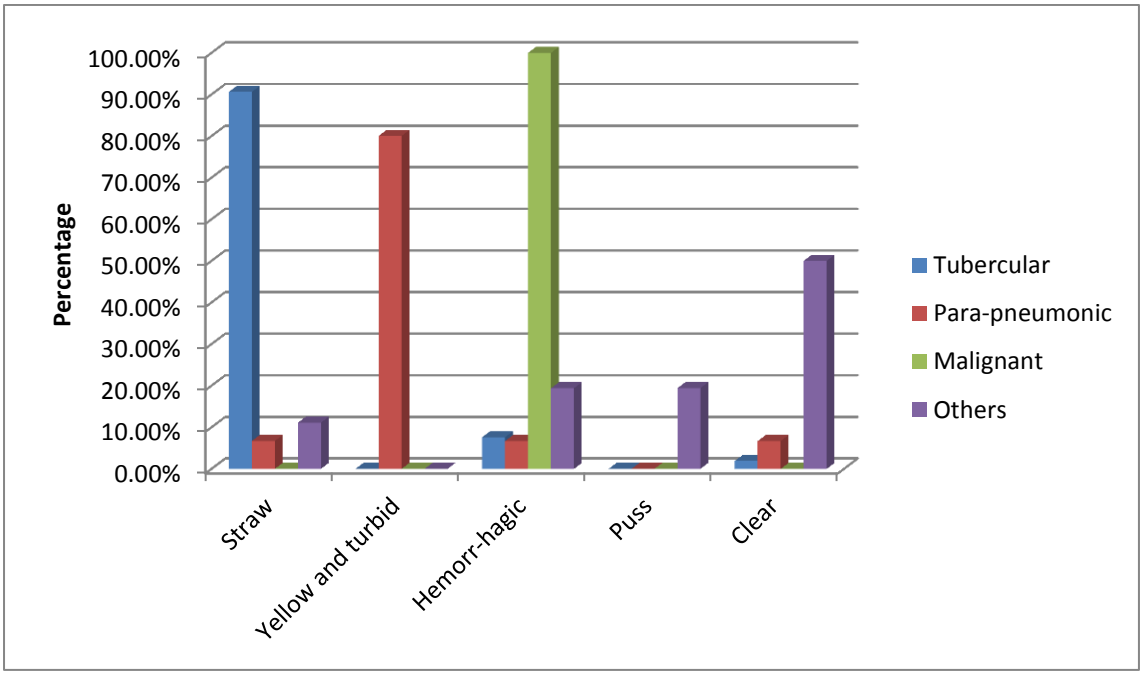

Table 20

Pleural fluid biochemistry profile

	Tubercular		Parapneumonic		Malignant		Other		Chi-square value	p-value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Pfglu (mg/dl)	112.5	73.4	67.4	74.2	120.9	48.5	120.5	84.9	1.9	0.128
Pf LDH (U/L)	1556.3	5218.5	4843.5	9066.6	1653.7	2797.7	1499.8	4386.5	1.6	0.19
S. LDH (U/L)	309.7	705.7	212.5	83.5	224.3	26.2	264.9	146.2	0.2	0.88
Pf:S LDH Ratio	3.9	7.2	25.5	52.8	7.2	11.9	8.7	27.5	2.9	0.035
Pf. Alb (g/dL)	2.5	0.7	2.1	0.6	2.2	0.6	1.5	0.9	13.6	0.000
Pf. Prot (g/dL)	4.9	1.2	4.3	0.9	4.0	0.9	2.9	1.6	17.2	0.000
S. prot (g/dL)	6.7	1.4	6.2	1.1	6.1	1.1	6.3	1.0	1.2	0.3
Pf: S prot ratio	0.9	0.9	0.7	0.1	0.6	0.2	0.5	0.2	2.6	0.058
ADA (U/L)	140.9	84.7	94.7	118.5	37.6	79.5	30.3	39.2	64.6	0.0001

N-No. Of Patients, SD- Standard deviation, %-Percentage,

glu- glucose, LDH- Lactate dehydrogenase, Pf:S- pleural fluid to serum, Alb- albumin, prot- protein, ADA- Adenosine deaminase

Figure 20

Pleural fluid biochemistry profile

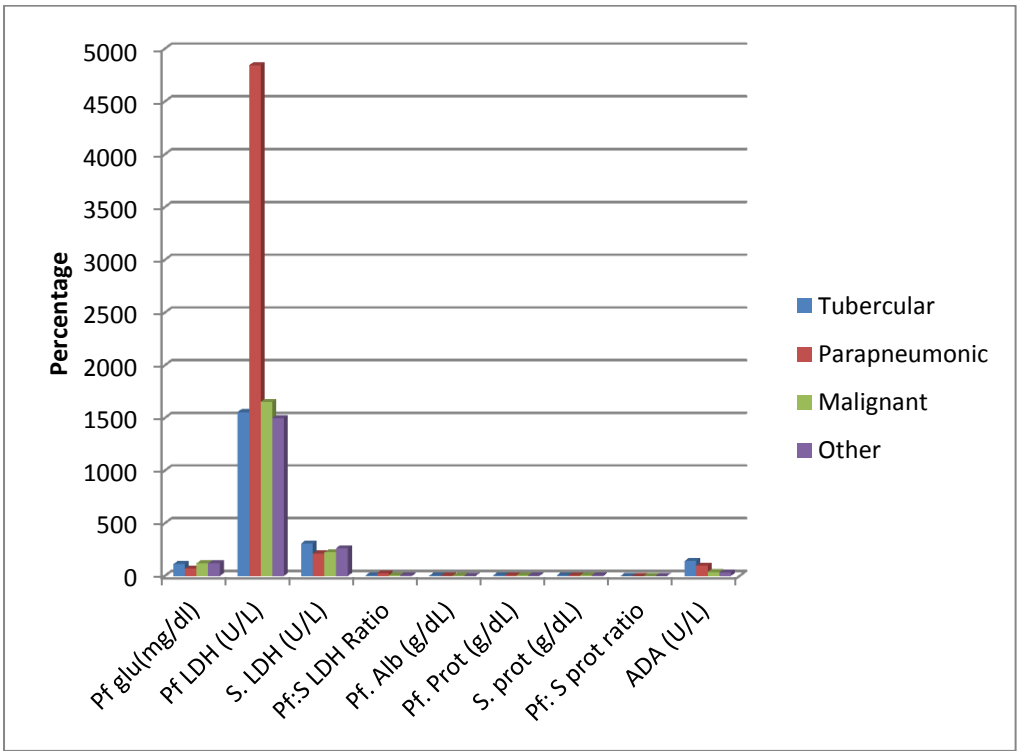

Table 21

Association of Pleural fluid Adenosine deaminase and etiology

Nature	Etiology	ADA (IU/L)			
		<40	40-60	>60	Total
Exudative	Tubercular	1	6	46	53
	Malignancy	9	1	2	12
	Parapneumonic	7	2	6	15
	Empyema	2	1	3	6
	Unknown	3	0	1	4
	Pancreatic	4	0	0	4
	Hemothorax	1	0	0	1
	Reactionary to Abdominal Surgery	1	0	0	1
Transudative	HFrEF and CKD	4	0	1	5
	CKD	2	0	0	2
	Anemia and Hypoproteinemia	2	0	0	2
	Unknown- Transudative	2	0	0	2
	HFnEF	1	0	0	1
	HFrEF and CKD	1	0	0	1
	Corpulmonale	1	0	0	1
	CLD	1	0	0	1
	Hypothyroidism	1	0	0	1
	HFrEF, AKI and Hypoproteinemia	1	0	0	1
	Total	44	10	59	113
	%	39%	9%	52%	100%

ADA – Adenosine deaminase, %- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 22

Association Of Pleural Fluid Adenosine Deaminase And Tuberculous And Malignant Pleural Effusion

Etiology		ADA		Total	Chi-square value	p-value
		< 40	> 40			
Tubercular pleural effusion	No	43	17	60	57.632	0.001
	Yes	1	52	53		
Malignant pleural effusion	No	35	66	101	7.343	0.011
	Yes	9	3	12		
Total		44	69	113		

Figure 21

Association Of Pleural Fluid Adenosine Deaminase And Tuberculous And Malignant Pleural Effusion

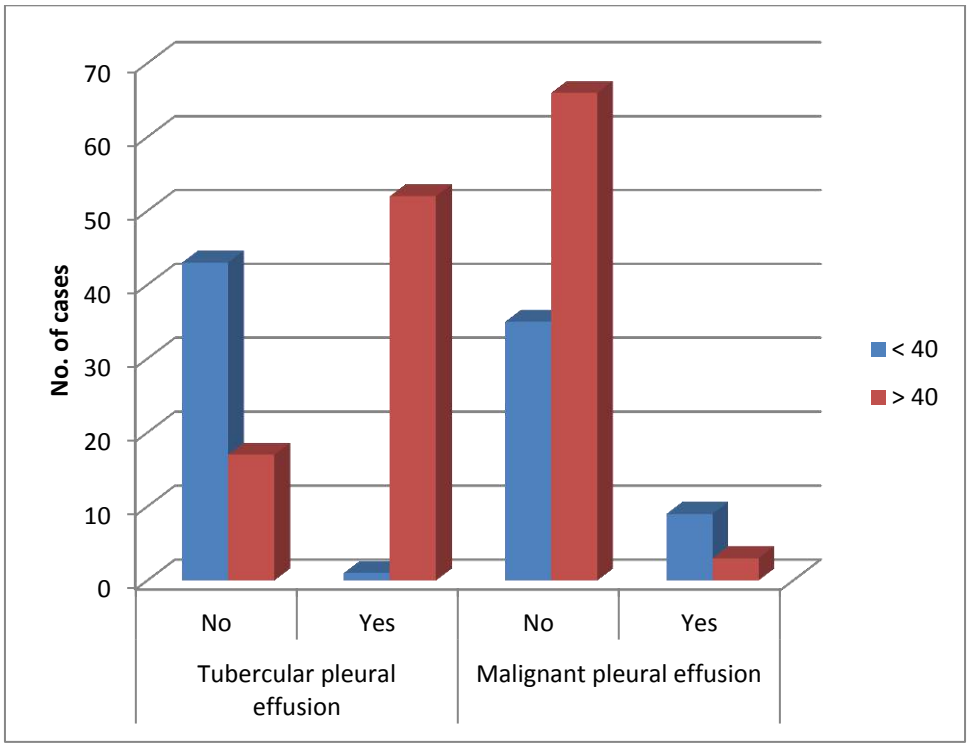

Table 23

Sensitivity and Specificity of ADA to Diagnose Tubercular Pleural Effusion

ADA (IU/L)	<40	>40	total
tubercular	1	52	53
non tubercular	17	43	60
total	95	18	113
Statistic	Value	95% CI	
Sensitivity	75.36%	63.51% to 84.95%	
Specificity	97.73%	87.98% to 99.94%	
Positive Likelihood Ratio	33.16	4.75 to 231.28	
Negative Likelihood Ratio	0.25	0.17 to 0.38	
Disease prevalence (*)	61.06%	51.44% to 70.09%	
Positive Predictive Value (*)	98.11%	88.17% to 99.73%	
Negative Predictive Value (*)	71.67%	62.55% to 79.30%	
Accuracy (*)	84.07%	76.00% to 90.28%	

ADA- Adenosine deaminase, %- percentage

Table 24

Distribution of Subjects According to Etiology and Pleural Fluid Glucose Levels

Nature	Etiology	N	Mean (mg/dl)	SD
Exudative	Tuberculous	53	112.5	73.4
	Parapneumonic	15	67.4	74.2
	Malignant	12	120.9	48.5
	Empyema	6	37.5	54.4
	Unknown	4	136.0	18.2
	Pancreatic	4	117.0	57.5
	Hemothorax	3	154.5	16.3
	Tubercular Empyema	1	41.0	.
	Reactionary to abdominal surgery	1	114.0	.
Transudative	HFrEF and CKD	5	116.40	69.81
	CKD	2	130.00	7.07
	Anemia and Hypoproteinemia	2	266.00	162.64
	Unknown	2	75.00	94.75
	HFnEF	1	376.00	.
	HFrEF CKD	1	125.00	.
	Corpulmonale	1	146.00	.
	CLD	1	107.00	.
	Hypothyroidism	1	129.00	.
	HFrEF, AKI and Hypoproteinemia	1	108.00	.
	Total	116	109.9	76.1

ADA- Adenosine deaminase, N- Number of patients, %- Percentage, SD- Standard deviation, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 25

Association between Pleural Fluid Sugar Level and Etiology

Nature	Etiology	Pleural fluid sugar (mg/dl)			
		< 40	40-100	>100	Total
Exudative	Tubercular	0	26	27	53
	Parapneumonic	8	3	4	15
	Malignant	0	3	9	12
	Empyema	5	0	1	6
	Unknown	0	0	4	4
	Pancreatic	0	2	2	4
	Hemothorax	0	1	2	3
	Tubercular empyema	1	0	0	1
	Reactionary to Abdominal Surgery	0	0	1	1
Transudative	HFrEF and CKD	0	2	3	5
	CKD	0	0	2	2
	Anemia and Hypoproteinemia	0	0	2	2
	Unknown	0	1	1	2
	HFnEF	0	0	1	1
	HFrEF and CKD	0	0	1	1
	Corpulmonale	0	0	1	1
	CLD	0	0	1	1
	Hypothyroidism	0	0	1	1
	HFrEF, AKI and Hypoproteinemia	0	0	1	1
	Total	14	38	64	116
	%	12.1%	32.8%	55.2%	100%

%- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 26

Association of Pleural Fluid Lactate Dehydrogenase and Etiology

Nature	Etiology	Pf:S LDH ratio				Total
		<0.6	0.6-1	1-2	>2	
Exudative	Tubercular	1	6	19	27	53
	Parapneumonic	1	1	0	13	15
	Malignancy	1	1	1	9	12
	Empyema	0	0	0	7	7
	Unknown	1	1	1	1	4
	Pancreatic	1	1	1	1	4
	Hemothorax	0	0	3	0	3
	Reactionary to Abdominal Surgery	0	1	0	0	1
Transudative	HFrEF and CKD	3	1	1	0	5
	Unknown	1	1	0	0	2
	Anemia and Hypoproteinemia	2	0	0	0	2
	CKD	0	0	2	0	2
	HFnEF	1	0	0	0	1
	HFrEF CKD	1	0	0	0	1
	Corpulmonale	1	0	0	0	1
	CLD	1	0	0	0	1
	Hypothyroidism	1	0	0	0	1
	HFrEF, AKI and Hypoproteinemia	1	0	0	0	1
	Total	17	13	28	58	116
	%	14.7%	11.2%	24.1%	50%	100%

Pf: S – pleural fluid to serum, LDH - Lactate Dehydrogenase, %- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 27

Distribution of Subjects according to pleural fluid pH

Nature	Etiology	pH				
		<7.0	7.0-7.2	7.2-7.4	>7.4	Total
Exudative	Tubercular	0	0	35	16	52
	Parapneumonic	6	4	1	1	12
	Malignancy	0	0	7	3	10
	Empyema	4	1	0	0	5
	Unknown	0	0	3	1	4
	Pancreatic	0	0	4	0	4
	Hemothorax	0	0	1	1	2
	Reactionary to abdominal surgery	0	0	0	1	1
Transudative	HFrEF and CKD	0	0	5	0	5
	CKD	0	0	2	0	2
	Anemia and Hypoproteinemia	0	0	2	0	2
	Unknown	0	0	1	1	2
	HFrEF and CKD	0	0	1	0	1
	Corpulmonale	0	0	1	0	1
	CLD	0	0	1	0	1
	Hypothyroidism	0	0	1	0	1
	HFrEF, AKI and Hypoproteinemia	0	0	0	1	1
	Total	10	5	65	25	106
	%	8.6%	4.3%	56.0%	21.6%	90.5%

%- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 28

Association of Pleural Fluid Differential Leukocyte Count and Etiology

Nature	Etiology	No. of patients with neutrophil predominance	%	No. of patients with lymphocyte predominance	%	N
Exudative	Tubercular	1	1.9%	52	98.1%	53
	Parapneumonic	14	93.3%	1	6.7%	15
	Malignancy	0	0.0%	12	100%	12
	Empyema	5	83.3%	1	16.7%	6
	Unknown	2	50%	2	50%	4
	Pancreatic	0	0.0%	4	100%	4
	Hemothorax	3	100%	0	0.0%	3
	Tubercular Empyema	0	0%	1	100%	1
	Reactionary to abdominal surgery	0	0.0%	1	100%	1
Transudative	HFrEF and CKD	0	0%	5	100%	5
	CKD	0	0%	2	100%	2
	Anemia and Hypoproteinemia	0	0%	2	100%	2
	Unknown	1	50%	1	50%	2
	HFnEF	0	0%	1	100%	1
	HFrEF and CKD	0	0%	1	100%	1
	Corpulmonale	0	0%	1	100%	1
	CLD	0	0%	1	100%	1
	Hypothyroidism	0	0%	1	100%	1
	HFrEF, AKI and Hypoproteinemia	0	0%	1	100%	1
	Total	26	22.4%	90	77.6%	116

%- percentage, N-Total number of patients, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 29

Association between Pleural Fluid Lymphocyte to Neutrophil Ratio and Etiology

Nature	Etiology	L/N ratio			
		<0.75	>0.75	% >0.75	Total
Exudative	Tubercular	1	52	98%	53
	Parapneumonic	12	3	20%	15
	Malignancy	0	12	100%	12
	Empyema	5	2	29%	7
	Unknown	2	2	50%	4
	Pancreatic	0	4	100%	4
	Hemothorax	3	0	0%	3
	Reactionary to Abdominal Surgery	0	1	100%	1
Transudative	HFrEF and CKD	0	5	100%	5
	CKD	1	1	50%	2
	Anemia and Hypoproteinemia	0	2	100%	2
	HFnEF	0	1	100%	1
	HFrEF and CKD	0	1	100%	1
	Corpulmonale	0	1	100%	1
	CLD	0	1	100%	1
	Hypothyroidism	0	1	100%	1
	HFrEF, AKI and Hypoproteinemia	0	1	100%	1
	Unknown	0	2	100%	2
	Total	24	92	79.3%	116
	%	20.7%	79.3%	79.3%	100%

L/N ratio -lymphocyte to neutrophil ratio, %- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 30

Sensitivity and Specificity of Pleural Fluid Lymphocyte to Neutrophil Ratio > 0.75 to Diagnose Tuberculous Pleural Effusion

L/N ratio	yes	no
tubercular	52	1
non tubercular	40	23
L/N ratio > 0.75		
Statistic	Value	95% CI
Sensitivity	56.52%	45.78% to 66.83%
Specificity	95.83%	78.88% to 99.89%
Positive Likelihood Ratio	13.57	1.97 to 93.19
Negative Likelihood Ratio	0.45	0.35 to 0.58
Disease prevalence (*)	79.31%	70.80% to 86.27%
Positive Predictive Value (*)	98.11%	88.33% to 99.72%
Negative Predictive Value (*)	36.51%	30.98% to 42.41%
Accuracy (*)	64.66%	55.24% to 73.31%

L/N ratio -lymphocyte to neutrophil ratio, %- percentage

Figure 22

Sensitivity and Specificity of Pleural Fluid Lymphocyte to Neutrophil Ratio > 0.75 to Diagnose Tuberculous Pleural Effusion

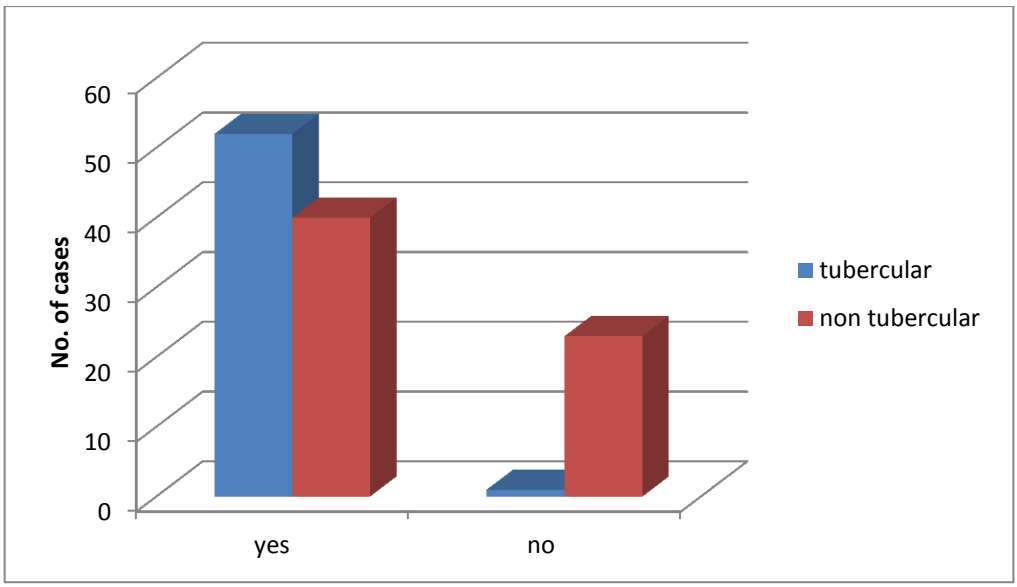

Table 31

Distribution of Subjects with ADA>40 & L/N ratio >0.75

ADA>40 & L/N >0.75		
Etiology	No. of Patients	%
Empyema	1	1.7%
Malignant	3	5.2%
Tubercular	52	89.6%
Tubercular Empyema	1	1.7%
HFrEF and CKD	1	1.7%
Grand Total	58	100%

L/N ratio-lymphocyte to neutrophil ratio, ADA – Adenosine deaminase, %- percentage

Figure 23

Distribution of Subjects with ADA>40 and L/N ratio >0.75

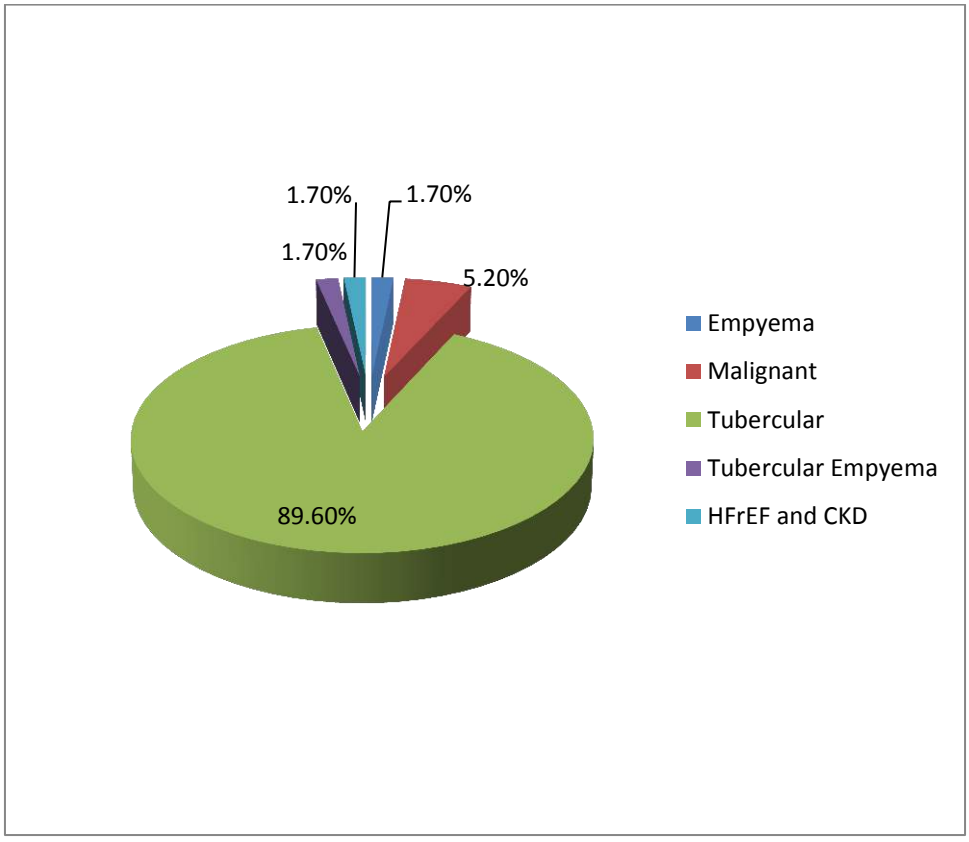

Table 32

Sensitivity and Specificity of Pleural Fluid Lymphocyte to Neutrophil Ratio>0.75andADA>40 to Diagnose Tuberculous Pleural Effusion

L/N ratio and ADA > 40	yes	no
tubercular	52	1
non tubercular	6	57
L/N ratio and ADA > 40		
Statistic	Value	95% CI
Sensitivity	Value	95% CI
Specificity	89.66%	78.83% to 96.11%
Disease prevalence (*)	98.28%	90.76% to 99.96%
Positive Predictive Value (*)	50.00%	40.57% to 59.43%
Negative Predictive Value (*)	98.11%	88.15% to 99.73%
Accuracy (*)	90.48%	81.65% to 95.30%

Figure 24

Sensitivity and Specificity of Pleural Fluid Lymphocyte to Neutrophil Ratio>0.75andADA>40 to Diagnose Tuberculous Pleural Effusion

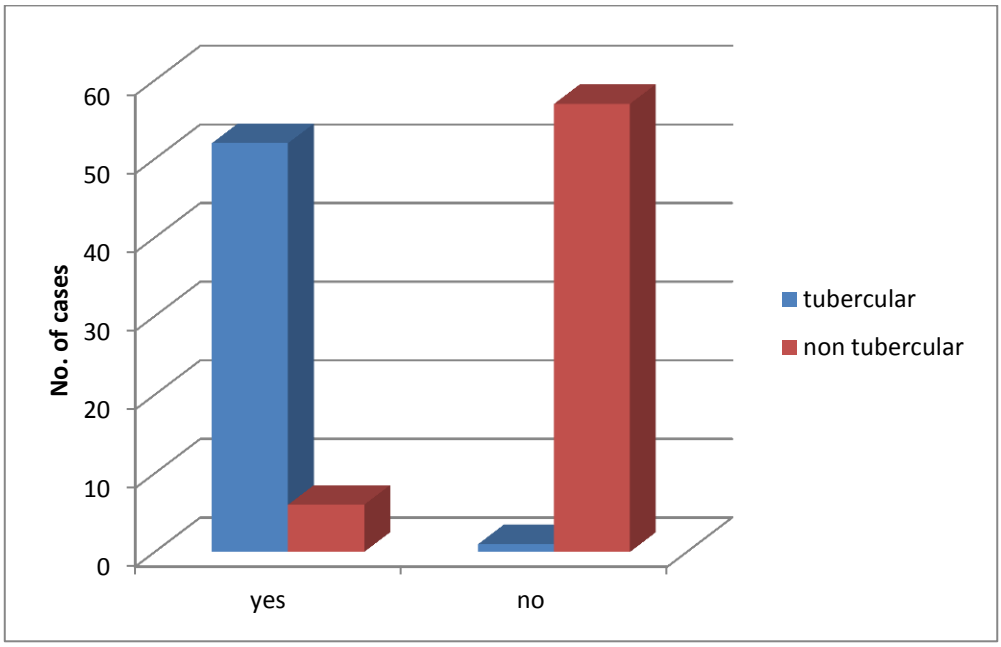

Table 33

Distribution of Subjects According to Mean Pleural Fluid Total Leucocyte Count

Nature	Etiology	N	Mean(/mm3)	SD
Exudative	Tubercular	53	2399.3	3381.4
	Parapneumonic	15	2516.7	4571.6
	Malignant	12	1487.5	1587.8
	Empyema	6	3435.5	4489.4
	Unknown	4	567.5	467.9
	Pancreatic	4	1395.0	1937.4
	Hemothorax	3	1106.7	349.5
	Reactionary to Abdominal Surgery	1	400.0	.
	Tubercular Empyema	1	1800.0	.
Transudative	HFrEF and CKD	5	1240.00	1064.425
	CKD	2	900.00	989.949
	Anemia and Hypoproteinemia	2	875.00	601.041
	Unknown	2	1350.00	919.239
	HFnEF	1	700.00	.
	HFrEF CKD	1	800.00	.
	Corpulmonale	1	400.00	.
	CLD	1	12.00	.
	Hypothyroidism	1	1800.00	.
	HFrEF, AKI and Hypoproteinemia	1	900.00	.
	Total	116	2015.6	3088.2

N- Number of patients, SD- standard deviation, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 34

Association of Pleural Fluid Total Leucocyte Cells and Etiology

Nature	Etiology	Pleural Fluid Total leukocyte cells (per mm3)				Total
		< 2500	2500-5000	5000-10000	> 10000	
Exudative	Tubercular	43	5	5	0	53
	Parapneumonic	12	1	1	1	15
	Malignant	9	3	0	0	12
	Empyema	3	2	0	1	6
	Unknown	4	0	0	0	4
	Pancreatic	3	1	0	0	4
	Hemothorax	3	0	0	0	3
	Reactionary to Abdominal Surgery	1	0	0	0	1
	Tubercular Empyema	1	0	0	0	1
Transudative	HFrEF and CKD	4	1	0	0	5
	CKD	2	0	0	0	2
	Anemia and Hypoproteinemia	2	0	0	0	2
	HFnEF	1	0	0	0	1
	HFrEF and CKD	1	0	0	0	1
	Corpulmonale	1	0	0	0	1
	CLD	1	0	0	0	1
	Hypothyroidism	1	0	0	0	1
	HFrEF, AKI and Hypoproteinemia	1	0	0	0	1
	Unknown	2	0	0	0	2
	Total	95	13	6	2	116
	Percentage	81.9 %	11.2%	5.2%	1.7%	100%

%-Percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 35

Distribution of Subjects according to pleural fluid culture

Pleural fluid C/S – Organism growth	No. of cases	Percentage
Staphylococcus aureus MRSA	4 2	3.4% 1.7%
Burkholderia	1	0.9%
Klebsiella	1	0.9%
Pseudomonas	1	2.6%
Sphingomonas	1	0.9%
VRE	1	0.9%
Fungus- Candida	1	0.9%
Contaminant (Staph. hemolyticus and epidermidis)	3	2.6%
No Growth	103	88.8%
Total	116	100%

MRSA- Staphylococcus aureus, VRE- Vancomycin resistant enterococcus, C/S- culture &sensitivity, %- percentage, Staph- Staphylococcus

Figure 25

Distribution of Subjects according to pleural fluid culture

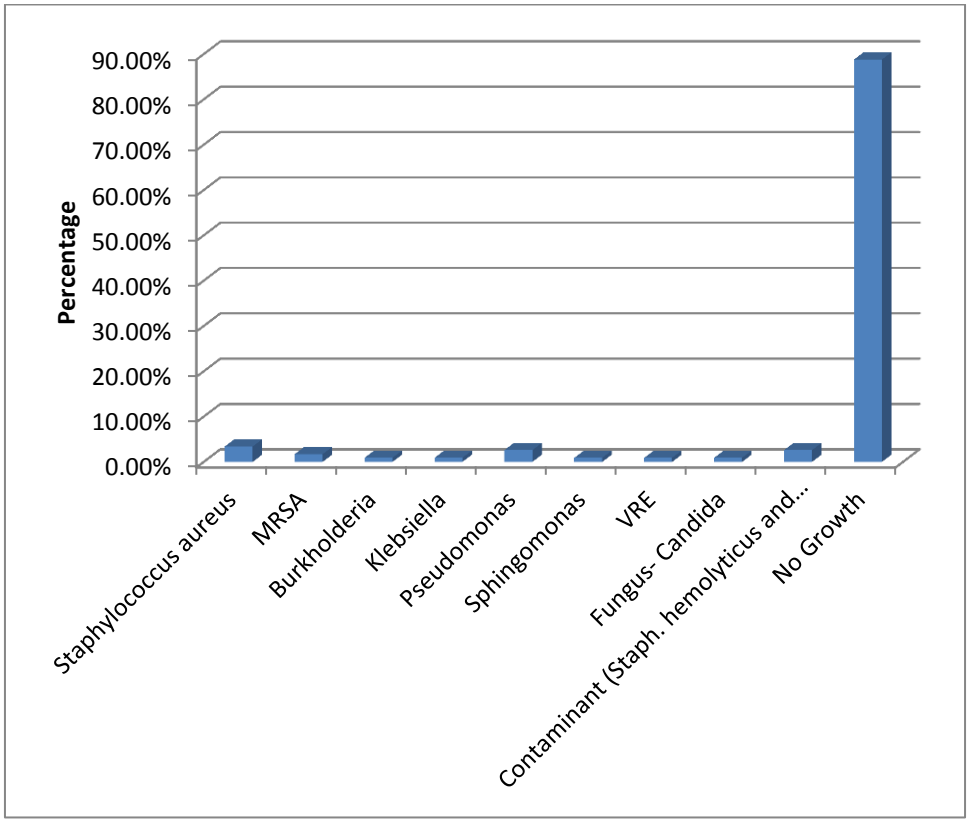

Table 36

Sensitivity and Specificity of CBNAAT in Tubercular Pleural Effusion

	TB	Non-TB	Total
CBNAAT Positive	9	0	9
CBNAAT Negative	45	58	103
Total	54	58	112
Statistic	Value	95% CI	
Sensitivity	16.67%	7.92% To 29.29%	
Specificity	100.00%	93.84% To 100.00%	
Disease Prevalence (*)	48.21%	38.67% To 57.85%	
Positive Predictive Value (*)	100.00%		
Negative Predictive Value (*)	56.31%	53.36% To 59.22%	
Accuracy (*)	59.82%	50.14% To 68.97%	

CBNAAT- cartridge based nucleic acid amplification test

Figure 26

Sensitivity and Specificity of CBNAAT in Tubercular Pleural Effusion

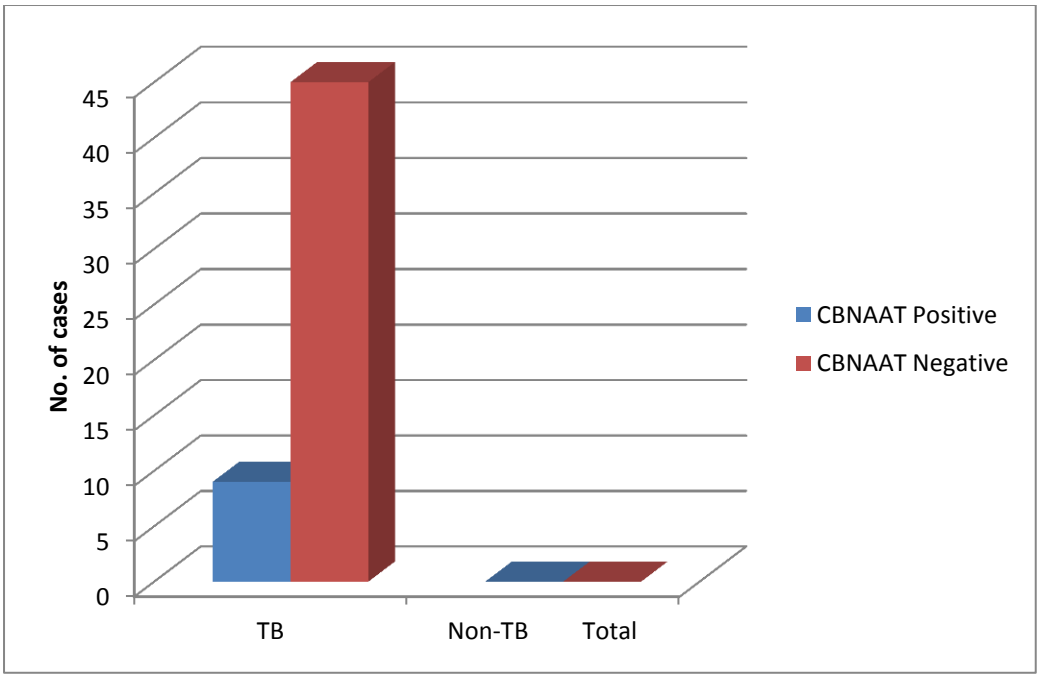

Table 37

Hemtological Laboratory Parameters

Laboratory Parameters	No of Patients (n=116)	%
Anemia	74	63.8%
Hb< 8 gm/dl	11	9.5%
Hb 8-11.9 gm/dl	63	54.3%
Leucopenia (TLC < 4000 /cu.mm)	0	0%
Leucocytosis (TLC > 120000 /cu.mm)	38	32.8%
Thrombocytopenia (Platelets <150000/cu.mm)	13	11.2%

%- percentage

Figure 27

Hematological Laboratory Parameters

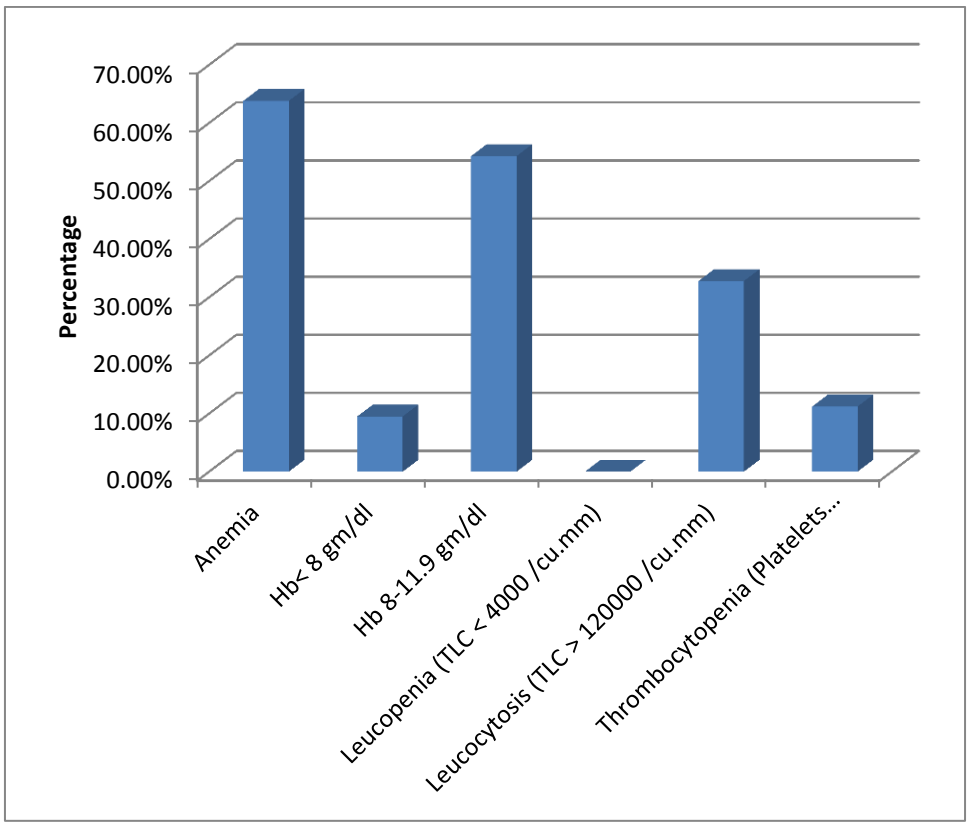

Table 38

Liver Function Parameters to Assess Hepatic Dysfunction

Laboratory parameter	No. of patients (n=116)	Percentage
Total bilirubin (≥1.5 mg/dL)	11	9.5%
Raised SGOT >50 IU	23	19.8%
Raised SGPT >50 IU	21	18.1%
Raised ALP >125 IU	45	38.8%
Serum albumin <3.5 gm/dL	81	69.8%

SGOT- Aspartate aminotranferase, SGPT- Alanine aminotransferase, ALP-Alkaline phosphatase, %- Percentage

Figure 28

Liver Function Parameters to Assess Hepatic Dysfunction

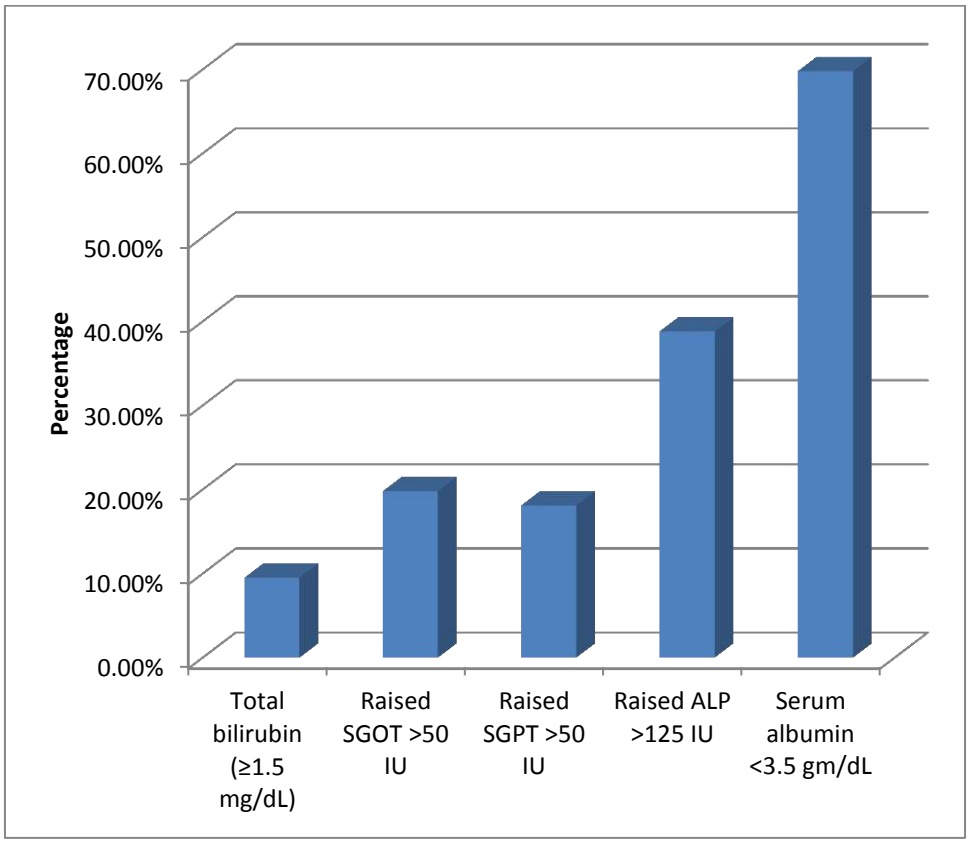

Table 39

Renal Function Parameters to assess Renal Dysfunction

Laboratory parameter	No. of patients (n=116)	Percentage
Raised serum creatinine (≥ 1.5 mg/dL)	23	19.8%
Hyponatremia<135 mmol/L	42	36.2%
Hypernatremia>145 mmol/L	6	5.2%
Hypokalemia<3.5 mmol/L	14	12.0%
Hyperkalemia>5.0 mmol/L	17	14.7%

%- percentage

Figure 29

Renal Function Parameters to assess Renal Dysfunction

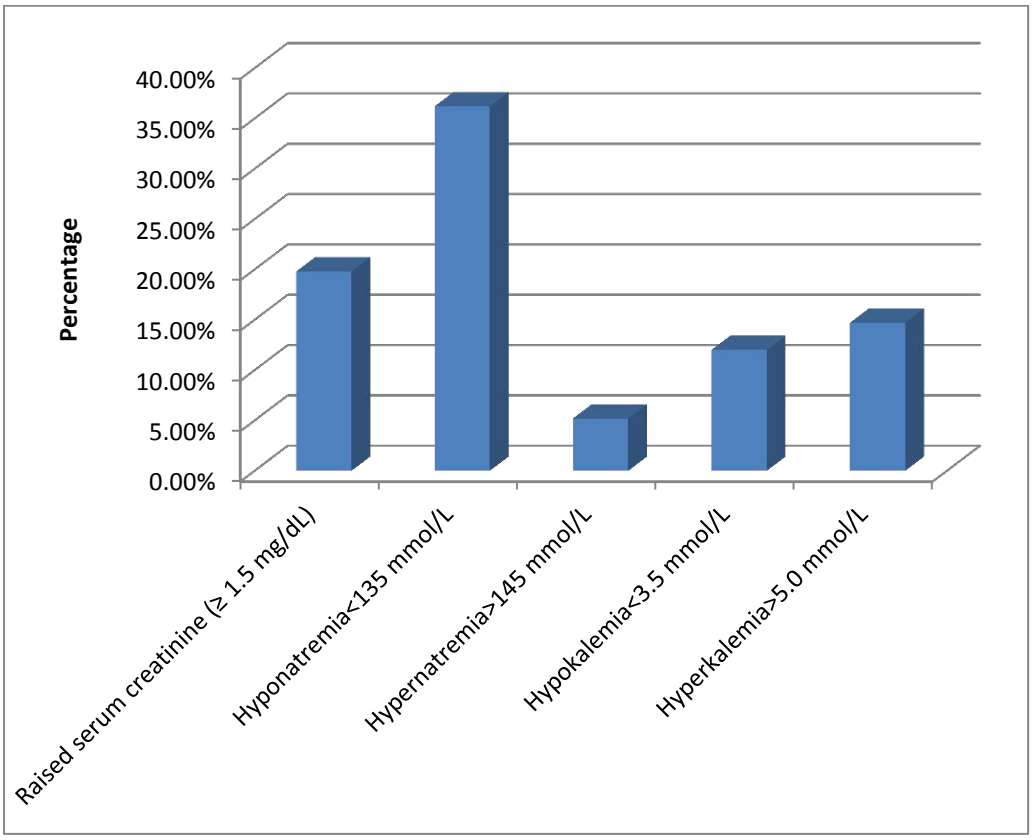

Table 40

Distribution of Subjects According to Sputum Culture

Sputum C/S - Organism	No. Of Cases	%
Pseudomonas	5	4.3%
Klebsiella	4	3.4%
Acinetobacter	2	1.7%
Fungal	2	1.7%
Escherichia Coli	1	0.9%

C/S- culture and sensitivity, %- percentage

Figure 30

Distribution of Subjects According to Sputum Culture

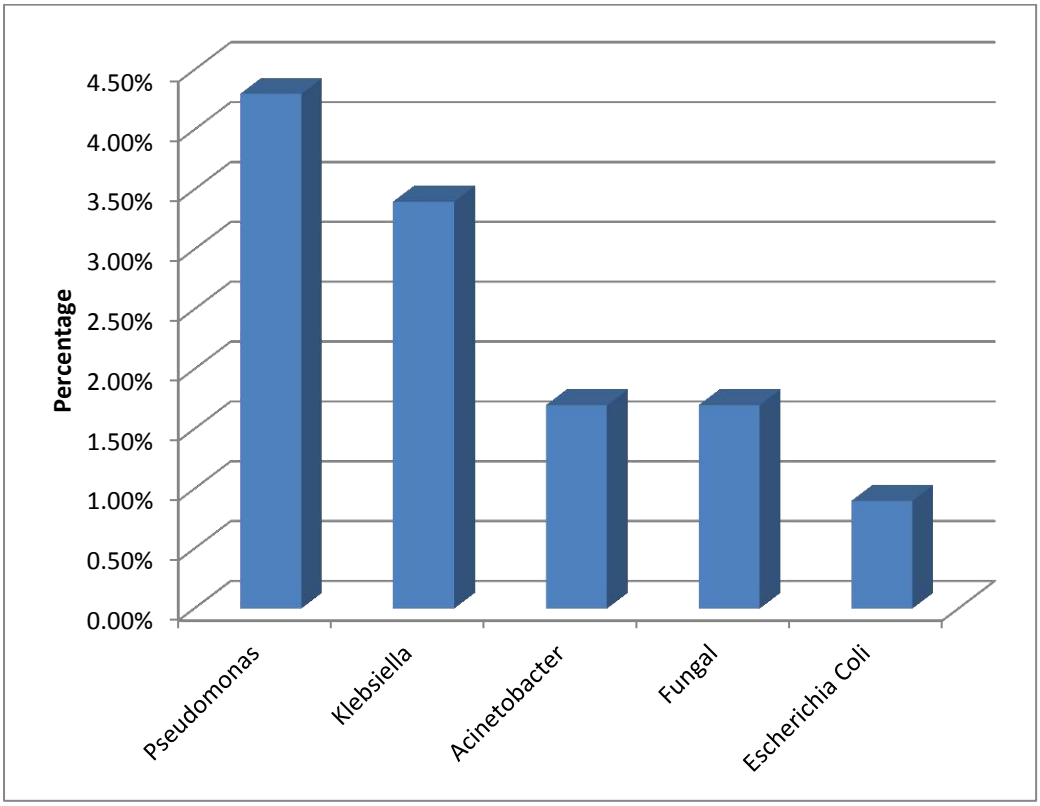

Table 41

Distribution of Subjects According to Laterality of Pleural Effusion and Etiology (Radiologically/Clinically)

Nature	Etiology	Laterality of Pleural Effusion				Total
		Left Sided		Right Sided		
Exudative	Tubercular	20	37.7%	33	63.3%	53
	Parapneumonic	5	33.3%	10	66.6%	15
	Malignant	5	41.6%	7	58.3%	12
	Empyema	2	33.3%	4	66.6%	6
	Pancreatic	4	100%	0	0.00%	4
	Unknown- Exudative	3	75%	1	25%	4
	Hemothorax	1	33.3%	2	66.6%	3
	Reactionary to Abdominal Surgery	0	0.00%	1	100%	1
	Tubercular Empyema	0	0.00%	1	100%	1
Transudative	HFrEF and CKD	1	20%	4	80%	5
	CKD	2	100%	0	0%	2
	Anemia and Hypoproteinemia	1	50%	1	50%	2
	Unknown- Transudative	0	0%	2	100%	2
	HFnEF	1	100%	0	0%	1
	HFrEF CKD	1	100%	0	0%	1
	Corpulmonale	1	100%	0	0%	1
	CLD	0	0%	1	100%	1
	Hypothyroidism	1	100%	0	0%	1
	HFrEF, AKI and Hypoproteinemia	1	100%	0	0%	1
	Total	49	42.24%	67	57.75%	116

%-percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 42

Distribution of Subjects According to Grade of Pleural Effusion and Etiology

Etiology	Grade of pleural effusion					
	No of Patients			Percentage of Patients		
	Mild	Mod	Severe	Mild	Mod	Severe
Tubercular	29	22	2	55%	42%	4%
Parapneumonic	10	5	0	67%	33%	0%
Malignant	3	4	5	25%	33%	42%
Others	22	11	3	61%	31%	8%
Total	64	42	10	55%	36%	9%
Chi-square value	21.304					
p-value	0.002					

%-Percentage, Mod- Moderate

Figure 31

Distribution of Subjects According to Grade of Pleural Effusion and Etiology

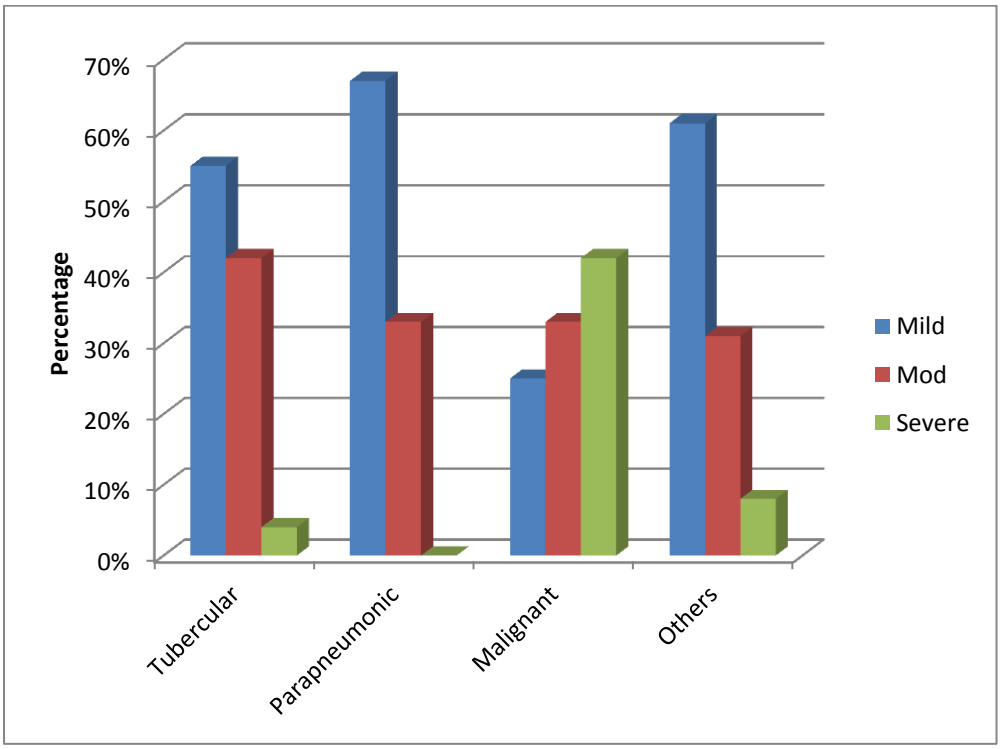

Table 43

Distribution of Subjects According to Ultrasonography Abdomen Findings

USG findings	No. of cases	%
Free fluid	11	9.5%
RPC	10	8.6%
Hepatomegaly	9	7.7%
Splenomegaly	7	6.0%
Liver echotexture changes	4	3.4%
Bulky pancreas	4	3.4%

RPC- Renal parenchymal changes, %- percentage

Figure 32

Distribution of Subjects According to Ultrasonography Abdomen Findings

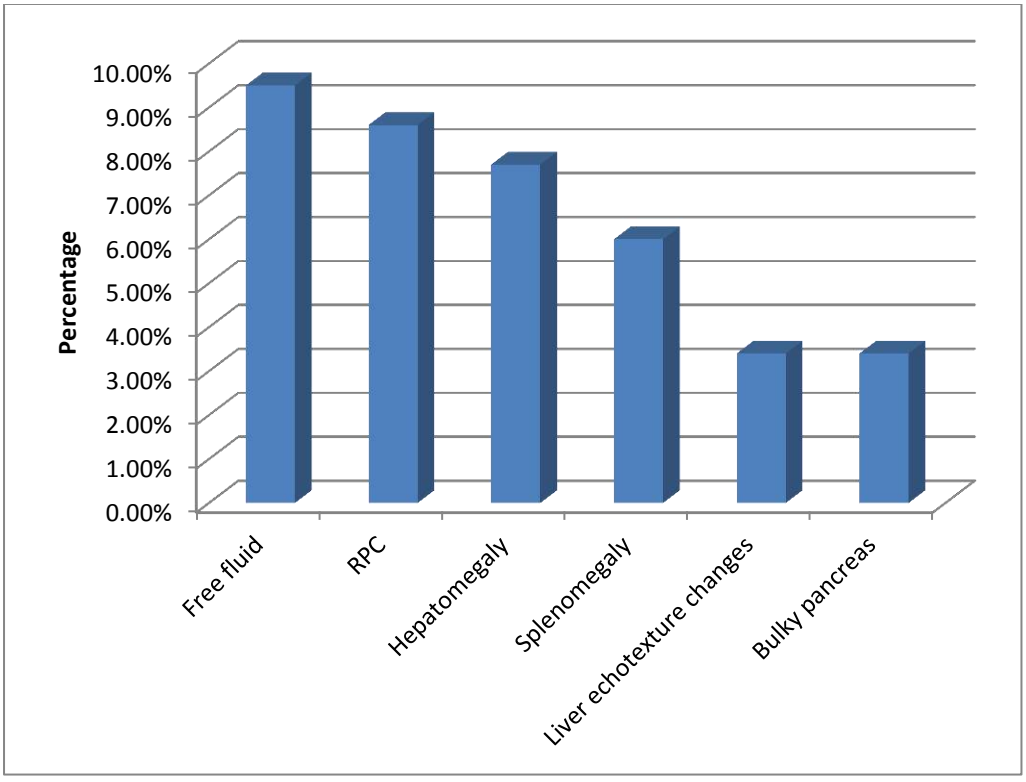

Table 44

Distribution of Subjects according to Computed Tomography Chest findings

CT chest findings	No. of cases	Percentage (%)
Unilateral pleural effusion	47	100%
Mediastinal LAP	12	25.5%
Consolidation	12	25.5%
Nodular lesion	6	12.7%
Bronchiectasis or fibrosis	5	10.6%
Single cavitary lesion	4	8.5%
Multiple cavitary lesion	3	6.3%
Lung mass	3	6.3%
Pleural thickening	3	6.3%
GGO	3	6.3%
Milliary mottling	2	4.2%
PTE	1	2.1%
AFL	1	2.1%

CT- Computed tomography, LAP- Lymphadenopathy, GGO- Ground glass opacity, PTE- pulmonary thromboembolism, AFL- air fluid level, %-Percentage

Figure 33

Distribution of Subjects according to Computed Tomography Chest findings

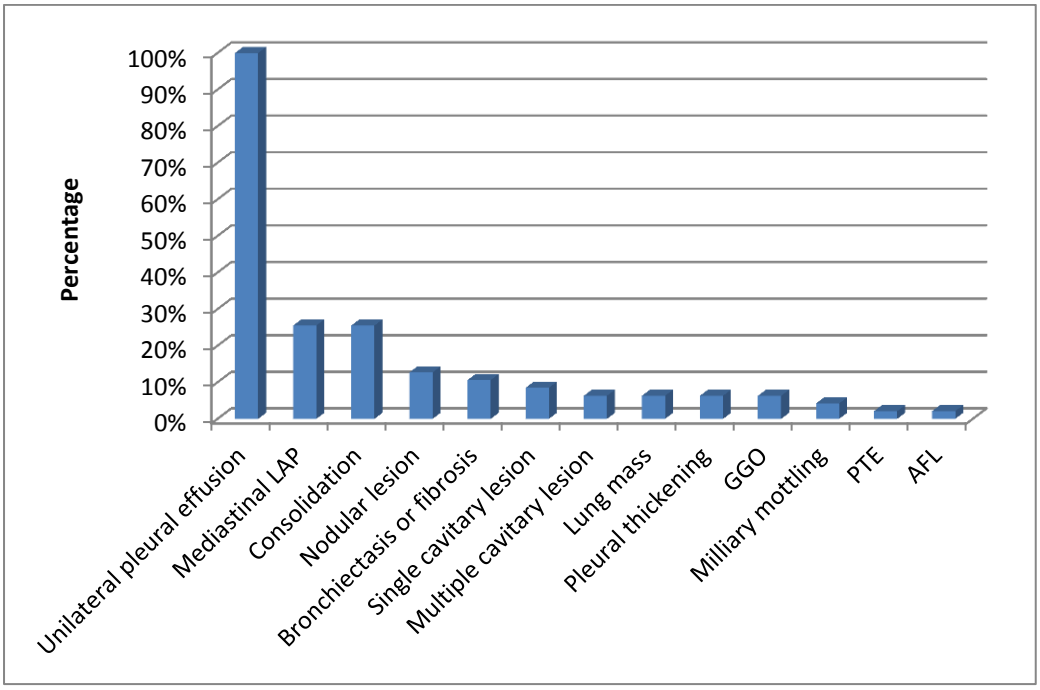

Table 45

Distribution of Subjects according to Probable Etiology Based on CT Chest

Probable etiology based on CT chest	No. of cases	%
Tubercular	17	36.1%
Malignant	7	14.9%
Non tubercular	23	48.9%
Total	47	100%

CT- Computed tomography, %-Percentage

Figure 34

Distribution of Subjects according to Probable Etiology Based on CT Chest

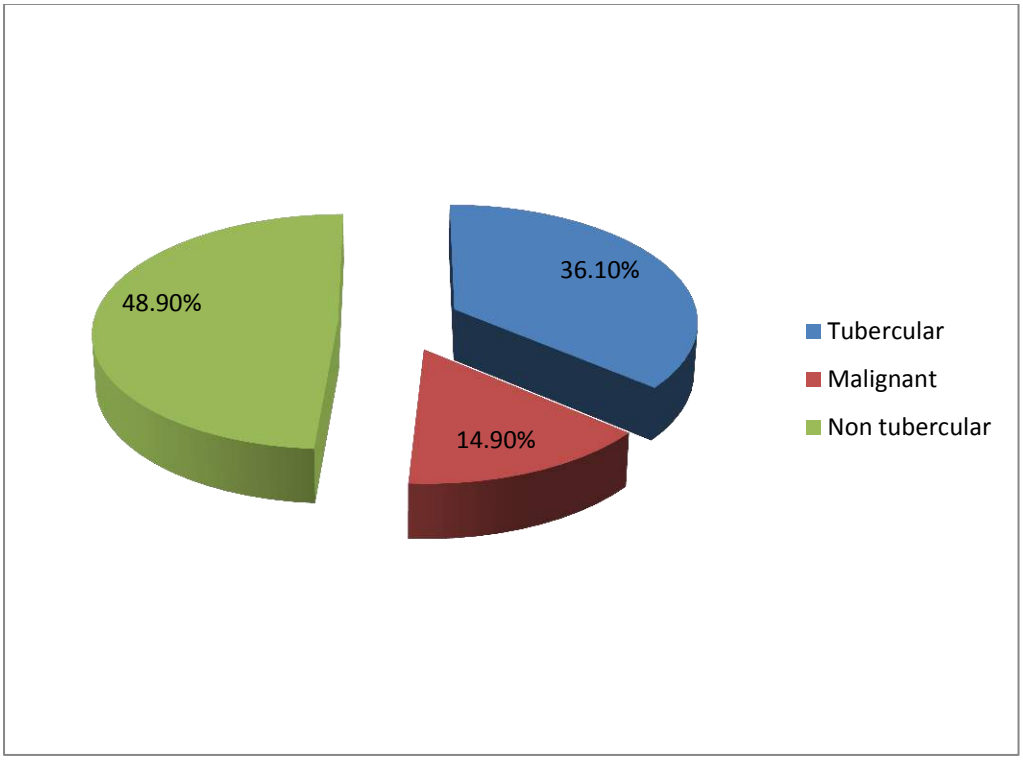

Table 46

Distribution of Subjects According to Echo Finding

Echocardiography Finding	No of Cases	Percentage
EF <60%,	9	7.8%
LVH	10	8.6%
LV Diastolic Dysfunction	7	6.0%
Global Hypokinesia	5	4.3%
RV Dysfunction	5	4.3%
RWMA	3	2.6%
Dilated LA	2	1.7%

EF- ejection fraction, RWMA- Regional wall motion abnormality LVH- Left ventricle hypertrophy, LA- Left atria, RV- Right ventricle,%- Percentage

Figure 35

Distribution of Subjects According to Echo Finding

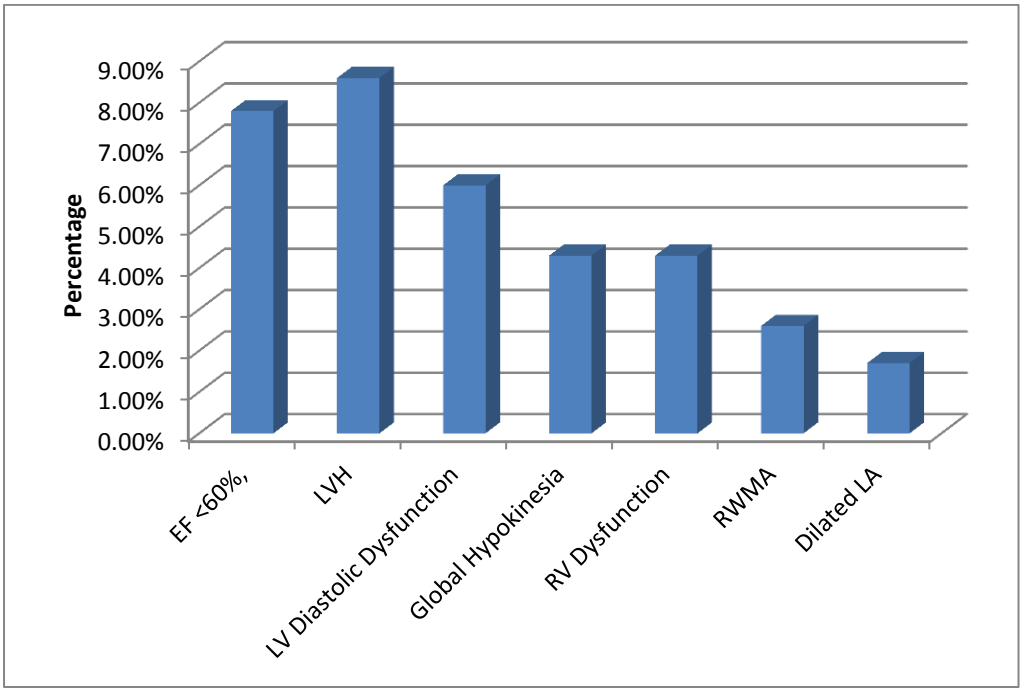

Table – 47

Distribution of Subjects According to Biopsy

Tissue	Biopsy findings	Clinical diagnosis
Lung cavity	Lung abscess with adjacent resolving pneumonia	ABPA with Empyema
Lung	Adenocarcinoma	Tubercular pleural effusion
Endobronchial Biopsy	NAD	Carcinoma Lung with malignant pleural effusion
Pleural biopsy	Granuloma, TB-PCR positive	Tubercular Empyema
Hepatic Lesion	Metastatic deposit likely adenocarcinoma lung	Carcinoma lung with malignant pleural effusion
Cervical LN	Reactive hyperplasia	Sputum positive pulmonary TB

LN – lymph node, TB- tuberculosis, PCR- polymerase chain reaction, NAD- no significant abnormality detected, ABPA- allergic broncho-pulmonary aspergillosis

Table 48

Distribution of Subjects According to Medical Treatment Profile

Medical Management	No of Cases	Percentage
Antibiotic	35	30%
Anti-tubercular treatment	55	47%
Chemotherapy	4	3%
Supportive	14	12%
Decongestive Therapy	12	10%
Antifungal	6	5%

%- percentage

Figure 36

Distribution of Subjects According to Medical Treatment Profile

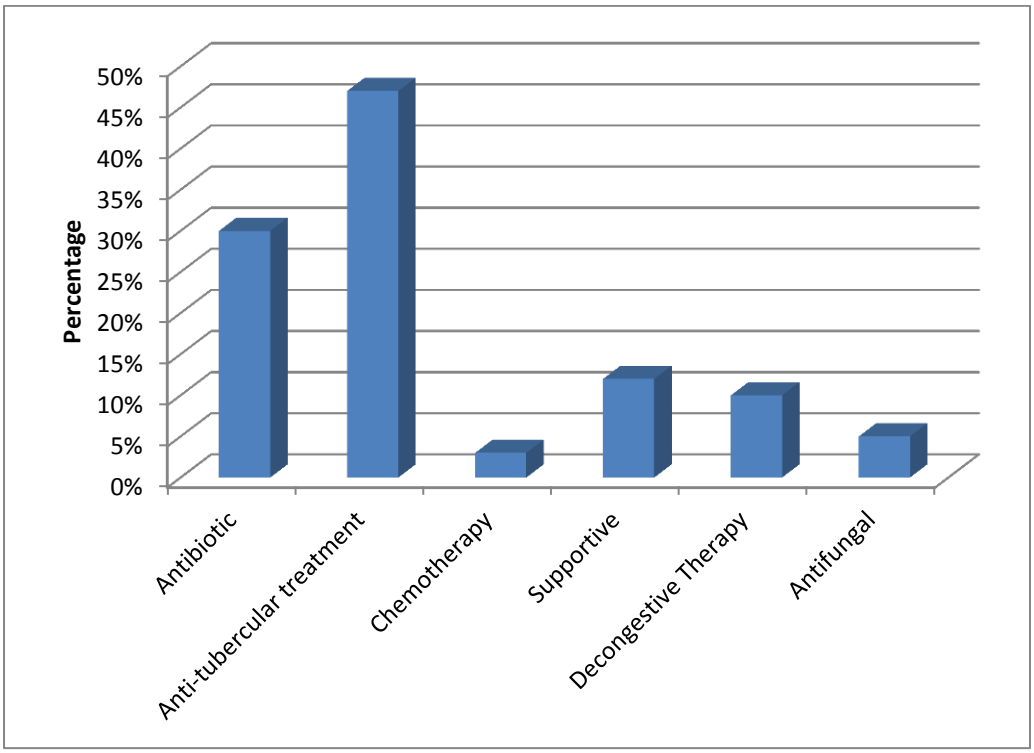

Table 49

Distribution of Patients Who Underwent Therapeutic Pleural Tap According to Etiology

Nature	Etiology	No of Cases	Percentage
Exudative	Malignant	10	8.6%
	Tubercular	9	7.8%
	Unknown- Exudative	2	1.7%
Transudative	HFrEF and CKD	1	0.9%
	CKD	1	0.9%
	HFrEF	1	0.9%
	corpulmonale	1	0.9%
	CLD	1	0.9%
	Total	26	22.4%

%- percentage, HFrEF- Heart failure with reduced ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease

Figure 37

Distribution of Patients Who Underwent Therapeutic Pleural Tap According to Etiology

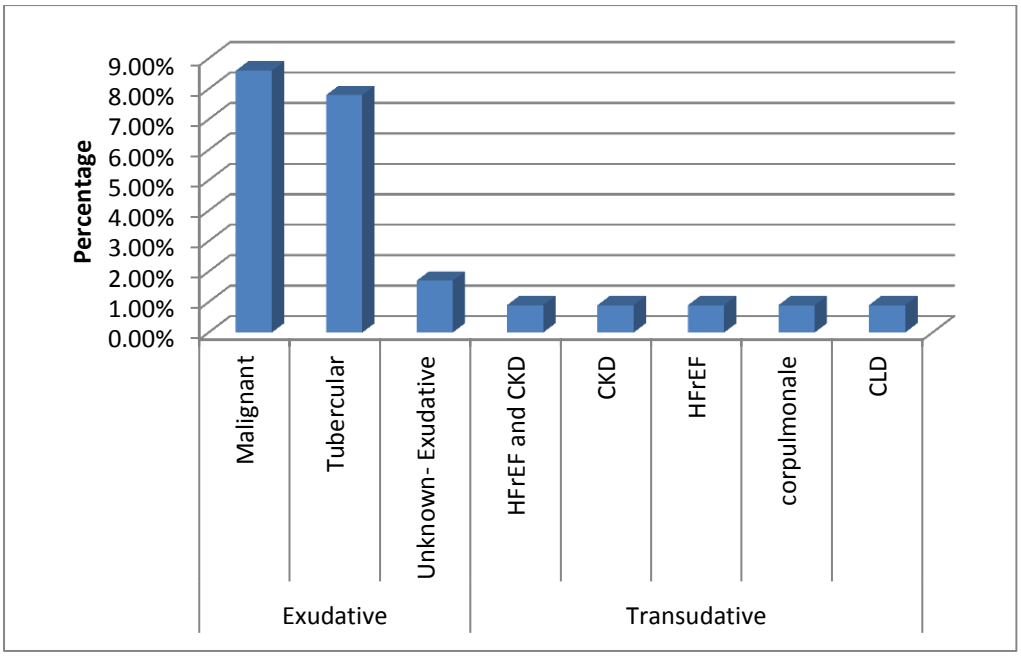

Table 50

Distribution of Subjects Requiring Chest Tube Insertion and Etiology

Nature	Etiology	No. of cases with ICD insertion	Percentage
Exudative	Tubercular	11	9.5%
	Loculated	6	
	Hydro-pneumothorax	2	
	Massive	2	
	Dyspnoea	1	
	Parapneumonic	11	9.5%
	Malignant	6	5.2%
	Empyema	6	5.2%
	Hemothorax	3	2.6%
	Unknown	2	1.7%
	Tubercular Empyema	1	0.9%
	Total	40	34.9%

ICD- Inter coastal drainage, %-Percentage

Figure 38

Distribution of Subjects Requiring Chest Tube Insertion and Etiology

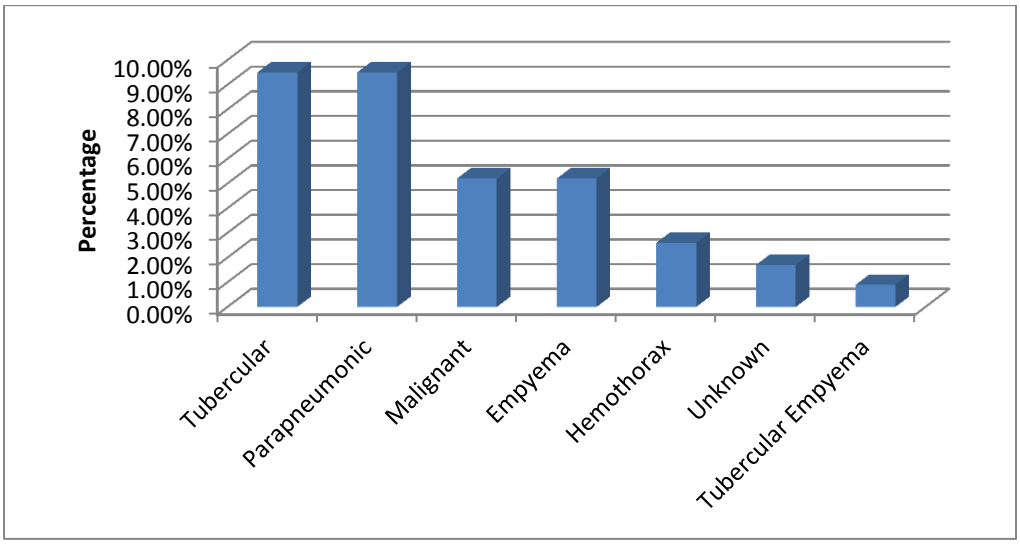

Table 51

Distribution of Subjects Requiring Streptokinase Insertion According to Etiology

Nature	Etiology	N	No. of patients requiring stk insertion	%
Exudative	Empyema	6	3	50%
	Parapneumonic effusion	15	7	46.6%
	Typical	4	1	
	Complicated	11	6	
	Tubercular	53	4	7.5%
	Total	116	14	12.1%

%- Percentage, stk- streptokinase

Table 52

Distribution of Subjects According to Surgery Requirement

Surgical Intervention - VATS	No. of cases	Percentage
No	115	99.1%
Yes	1	0.9%
Total	116	100.0%

VATS – video assisted thoracoscopic surgery, %-Percentage

Figure 39

Distribution of Subjects According to Surgery Requirement

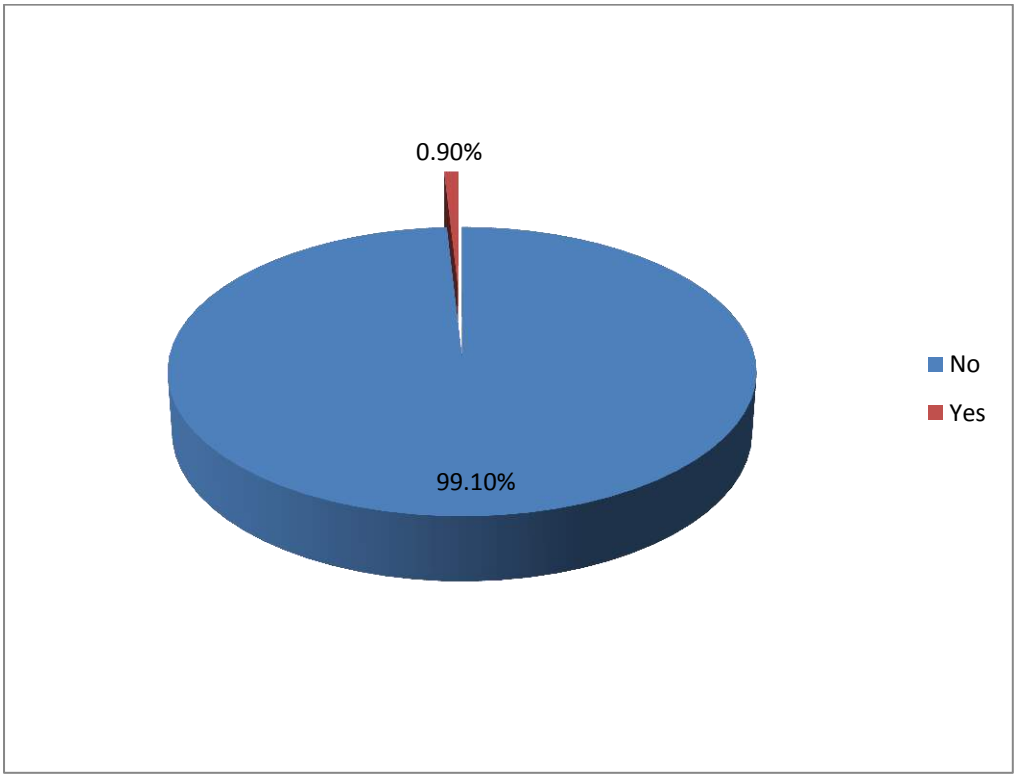

Table 53

Age & Etiology

Etiology	Tubercular		Para-pneumonic		Malignant		Others		Chi-square value	p-value
Age (Yrs)	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
	47.9	17.5	56.7	14.5	52.7	17.3	54.3	17.4	1.6	0.2

Yrs- Years, SD- Standard Deviation

Figure 40

Age & Etiology

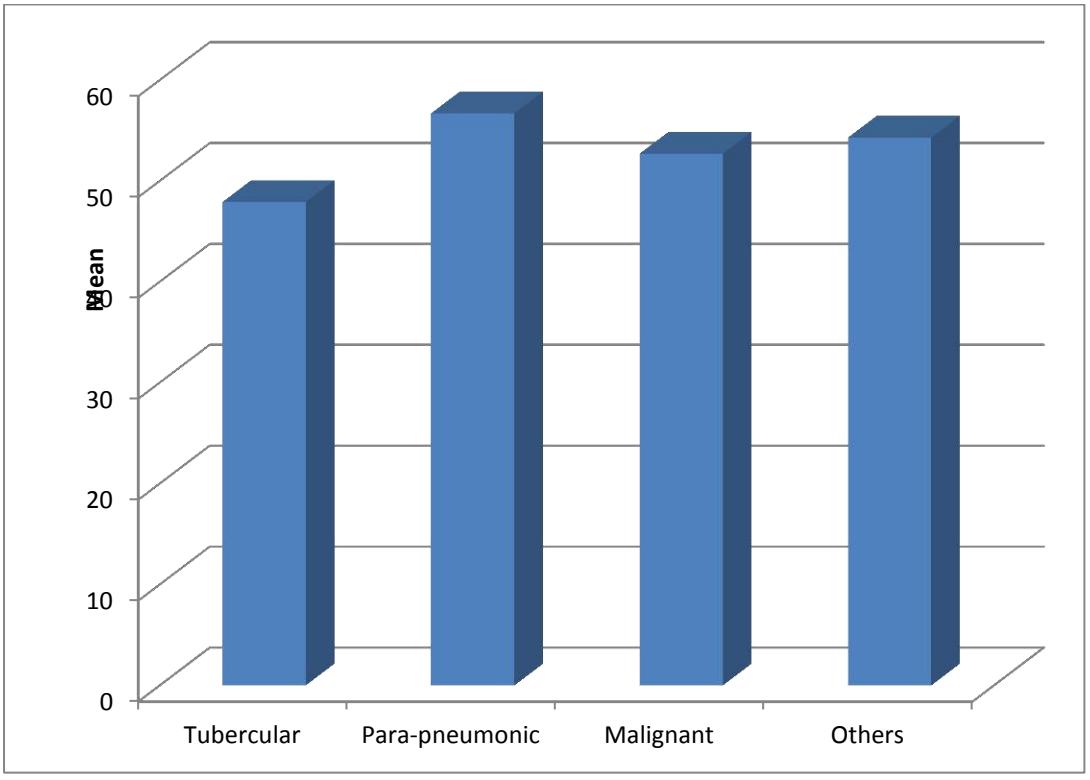

Table 54

Distribution of Patients According to Outcome

Outcome	No. of patients	Percentage
DAMA	18	15.5%
Discharge	98	84.5%
Death	0	00.0%
Total	116	100.0%

DAMA- discharge against medical advice, %- percentage

Figure 41

Distribution of Patients According to Outcome

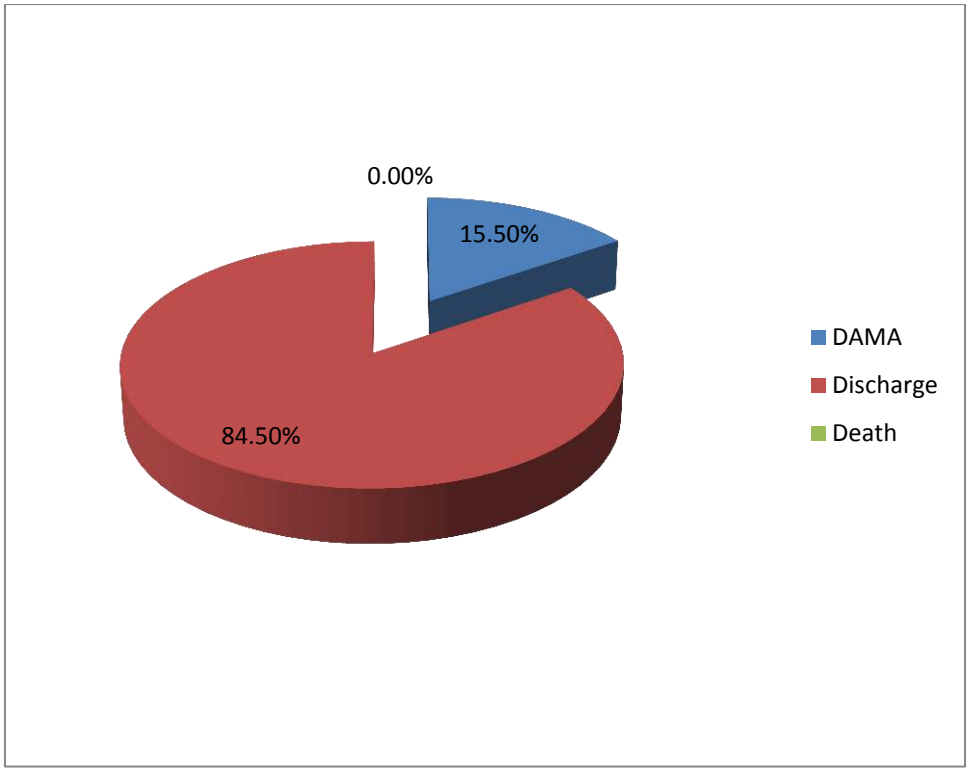

Table 55

Distribution of Patients According to Etiology of Pleural Effusion and Outcome

Nature	Etiology	DAMA	Discharge	Total
Exudative	Tubercular	3	50	53
	Parapneumonic	5	10	15
	Malignant	3	9	12
	Empyema	1	5	6
	Pancreatic	0	4	4
	Unknown- Exudative	2	2	4
	Hemothorax	0	3	3
	Reactionary to Abdominal Surgery	0	1	1
	Tubercular empyema	0	1	1
Transudative	HFrEF and CKD	0	5	5
	CKD	1	1	2
	Unknown- Transudative	1	1	2
	Anemia and Hypoproteinemia	1	1	2
	HFnEF	0	1	1
	HFrEF	0	1	1
	Corpulmonale	0	1	1
	CLD	0	1	1
	Hypothyroidism	0	1	1
	HFrEF, AKI and Hypoproteinemia	1	0	1
	Total	18	98	116

DAMA- discharge against medical advice, %- percentage, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

Table 56

Distribution of patients in Ward and ICU basis etiology

Nature	Etiology	ICU	Ward	Total
Exudative	Tubercular	8	45	53
	Parapneumonic	2	13	15
	Malignant	1	11	12
	Empyema	0	6	6
	Unknown- Exudative	0	4	4
	Pancreatitis	1	3	4
	Hemothorax	1	2	3
	Tubercular Empyema	0	1	1
	Reactionary to abdominal surgery	0	1	1
Transudative	HFrEF and CKD	0	5	5
	Unknown- Transudative	0	2	2
	CKD	0	2	2
	Anemia and Hypoproteinemia	0	2	2
	HFnEF	0	1	1
	HFrEF and CKD	0	1	1
	Corpulmonale	1	0	1
	CLD	0	1	1
	Hypothyroidism	0	1	1
	HFrEF, AKI and Hypoproteinemia	1	0	1
	Total	15	101	116

HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury, ICU- Intensive care unit.

Table 57

Distribution of Subjects According to Follow Up

			2 Month F/U				4 Month F/U				6 Month F/U			
Nature	Etiology		Constitutional feature				Constitutional feature				Constitutional feature			
		n	Improved	Not improved	Loss to F/U	died	Improved	Not improved	Loss to F/U	Died	Improved	Not improved	Loss to F/U	died
Exudative	Tuberculous	53	35	16	2	0	47	3	2	1	41	1	10	1
	Malignant	12	0	7	0	5	1	2	0	9	0	2	1	9
	Typical Parapneumonic	4	1	3	0	0	3	0	1	0	2	0	2	0
	Simple Complicated Parapneumonic	4	3	0	0	1	3	0	0	1	3	0	0	1
	Complex Complicated Parapneumonic	7	4	1	1	1	4	0	2	1	3	0	3	1
	Empyema	6	2	4	0	0	5	0	1	0	3	0	3	0
	Unknown	4	2	2	0	0	3	1	0	0	2	0	2	0
	Pancreatic	4	3	1	0	0	4	0	0	0	4	0	0	0
	Hemothorax	3	3	0	0	0	3	0	0	0	3	0	0	0
	Reactionary	1	1	0	0	0	1	0	0	0	1	0	0	0
	Tubercular Empyema	1	1	0	0	0	1	0	0	0	1	0	0	0
Transudative	HFrEF and CKD	5	5	0	0	0	5	0	0	0	5	0	0	0
	CKD	2	1	1	0	0	1	1	0	0	1	0	0	1
	Anemia and Hypoproteinemia	2	2	0	0	0	2	0	0	0	1	0	1	0
	HFnEF	1	1	0	0	0	1	0	0	0	1	0	0	0

	HFrEF and CKD	1	1	0	0	0	1	0	0	0	1	0	0	0
	Corpulmonale	1	1	0	0	0	1	0	0	0	1	0	0	0
	CLD	1	1	0	0	0	1	0	0	0	1	0	0	0
	Hypothyroidism	1	1	0	0	0	1	0	0	0	1	0	0	0
	HFrEF, AKI and Hypoproteinemia	1	1	0	0	0	0	0	1	0	0	0	1	0
	Unknown	2	2	0	0	0	2	0	0	0	2	0	0	0
	Total	116	71	35	3	7	90	7	7	12	77	3	23	14

F/U- follow up, n- number of patients, HFrEF- Heart failure with reduced ejection fraction, HFnEF- Heart failure with normal ejection fraction, CKD- chronic kidney disease, CLD- chronic liver disease, AKI- Acute kidney injury

DISCUSSION

This prospective and observational study was carried over aperiod of 1 year from January 2019 to December 2019. It included 116 patients aged more than 18 years admitted with unilateral pleural effusion in department of Medicine and allied specialties of DMCH, Ludhiana as per the inclusion criteria.

81 (69.8%) patients were males and 35 (30.2%) patients were females. The male to female ratio was 2.3:1. In a previous study done by Mohan et al, 68% patients were males and 32% patients were females [16] which were in concordance with our results. Similarly in another study by Parikh et al, 68% patients were males and 32% patients were females. The male to female ratio was found to be 2.2:1[19]. This was also consistent with the study done by Maldhure et al [15] and Hirsch et al [32], which showed that male to female ratio was 2.13:1 & 2.5:1 respectively. This difference observed in our study can be attributed to the gender difference prevailing in Punjab as well as the more exposure of males to occupational hazards, smoking, tobacco chewing and infections.

The age of the patients ranged between 18 to 90 years with mean age of 51.5 ± 17.2 years in our study. Maximum patients (63.8%) were in the age group of 20 to 60 years. In a study done by Reddy et al [33], the mean age of study population was 48.8 years with most common age group being 20 to 60 years of age. In another study done in Qatar by Khan et al [34] showed that mean age group of study population was 47.4 ± 18.2 years. In a study by Raghavan et al [35], majority of the patients were in the age group of 30-60years with a mean age of 46.49 years. The possible explanation for the greater number of middle and old aged patients in our study is unilateral pleural effusion in older age group require admission and evaluation to rule out malignant etiology.

Average duration of clinical symptoms was 21 days in our study with a range of 1-180 days before coming to our institution. Loss of appetite, loss of weight and fatiguability were the chronic symptoms

present. Similar results were found in a study in Telangana in India by Reddy et al [33] where majority of the study population had 3–4 weeks duration of symptoms before coming to institution. Mean ± SD duration of symptoms was 3.82 ± 2.8 weeks. Similar study in Ethiopia by Desalew et al [36] showed that the mean duration of the symptoms was 66 days prior to hospital visit with a range of 3–365 days which was high when compared to our study. This may be due to better availability of healthcare facilities in India compared to Ethiopia.

Most common presenting symptoms in our study was shortness of breath (n=65, 56%), fever (n=62*, 53.4%; *including 23 patients with characteristic evening rise in temperature), cough (n=61, 52.5%), chest pain (n=41, 35.3%), anorexia (n=40, 34.5%), weight loss (n=22,18.9%), pain abdomen (n=16, 13.7%), night sweats (n=13, 11.2%), vomiting (n=12, 10.3%) and fatiguability (n=6, 5.1%). In a study by Reddy et al [33] in Telangana, most common presenting symptom was dyspnoea (84%) followed by cough (80%), fever (65%), chest pain (43%) and loss of weight and loss of appetite (27%) Another study done by Suresh Raghavan et al [35] showed that the most common presenting symptoms were dyspnoea (77%), pleuritic chest pain (66%), cough (45%), weight loss (42%) and fever (40%). Similar results were also seen in study done by Dhital et al [18] which found that shortness of breath (83%), cough (67%) and fever (66%) were the most common mode of clinical presentation in patients with pleural effusion.

In our study 36 patients (31%) had past history of diabetes mellitus (DM), 34 (29.3%) patients had hypertension (HTN), 25 (21.6%) patients had coronary artery disease (CAD), 19 patients (16.4%) had past history of tuberculosis (TB), 18 (15.5%) patients had chronic kidney disease (CKD), 12 (10.2%) patients with malignancy, 11 (9.5%) patients had hypothyroidism, 8 (6.9%) patients had chronic liver disease (CLD) and 8 (6.9%) patients had chronic obstructive pulmonary disease (COPD). In a similar study by Shashikant et al [23] past history of TB was present in 36.4% of cases followed by DM in 27.6% and CLD and CAD in 13.6%.

Pallor (n=72, 62.10%), pitting edema (n=24, 20.7%) and lymphadenopathy (LAP) (n=7, 5.1%) were the most common physical signs present. Out of 7, 4 patients had cervical LAP, 2 had axillary LAP and 1 had supraclavicular LAP. Similar results were seen in a study by Shashikant et al [23], which showed 50 % of patients had pallor, 23% had edema and 14% had icterus.

It was observed that reduced respiratory movements, decreased tactile vocal fremitus, diminished breath sound, stony dull note on percussion on the affected side were the most common findings present on chest examination. Similar findings were seen in a study by Hasan et al [20].

Diagnostic aspiration of pleural fluid was done in all the patients. It was observed that most of the pleural fluids (n= 53, 45.7%) were straw colored. Pleural fluid was hemorrhagic, clear, yellow and turbid and pus colored in 20.7% (n=24), 17.2% (n=20), 10.3% (n=12), 6.0% (n=7) of patients respectively. Most of straw colored (n=48/53, 90.57%) pleural fluid were found to be tuberculous whereas most of hemorrhagic pleural fluid (n=12/24; 50%) were found to be malignant. In a study by Mohan et al [16], tuberculous effusion was predominantly straw colored whereas malignant effusion was hemorrhagic. Another study by Raghavan et al [35] showed that 49 out of 54 tuberculous effusions were grossly straw colored in appearance and 12 out of 14 malignant effusions were blood stained.

Distinguishing between transudative and exudative effusion is traditionally considered a fundamental first step in the diagnosis of pleural effusion. In clinical practice, this is distinguished using Light's criteria. 99 patients (85.3%) had exudative and 17 patients (14.6 %) had transudative effusion in our study. Similar results were seen in a study conducted by Hooper et al [14] which showed that 101 patients (80%) were exudative and 19 patients (15%) were transudative. Another study by Arnold et al [26] showed that out of 921 patients with unilateral pleural effusion in their study, 803 patients (87%) had exudative and 118 patients (13%) had transudative nature of pleural effusion. Transudative pleural effusion occurs due to systemic cause

where pleural fluid accumulates because of an imbalance between the hydrostatic and oncotic pressures. In contrast, an exudative pleural effusion occurs when the local factors influencing the accumulation of pleural fluid are altered. So, this is possible reason for exudative pleural effusion tends to be more of unilateral.

Etiology of exudative pleural effusion was tubercular in 53 (45.7%) patients, parapneumonic in 15 (12.9%) patients, malignant in 12 (10.3%) patients, empyema in 7 (6.1%) patients, pancreatic in 4 (3.4%) patients, hemothorax in 3 (2.6%) patients and effusion reactionary to abdominal surgery in 1 (0.9%) patient. Etiology was unknown in4 (3.4%) patients. Tubercular pleural effusion was the most common cause probably due to higher prevalence of TB in India.

In a study by Reddy et al [33], the most frequent cause of pleural effusion was tuberculosis in38% of patients, followed by parapneumonic effusion (28.5%) and malignant pleural effusion (22.2%). Another study by Godwin et al [37] showed that the most common etiology was tuberculosis (42.2%) followed by parapneumonic effusion (14.07%) and malignancy (12.08%). A study in Qatar by Khan et al [34] showed that the most common cause of pleural effusion was tuberculosis, parapneumonic effusion, malignant effusion and cardiac failure in32.5%, 19%, 15.5%, and 13% of patients respectively. Similarly, study in Nepal by Dhital et al [18], found that the most common cause of pleural effusion was tuberculosis (32%), parapneumonic (30%) and malignancy (18%).

A study by Selvamani et al [38] in Tamil Nadu concluded that tuberculosis was the leading cause of pleural effusion accounting for 46% of cases followed by parapneumonic effusion (24%) and malignancy (14%). Similar results were seen in studies conducted in developing countries such as Iraq, Ghana and Pakistan [39-41]. The occurrence of parapneumonic effusion was higher in developing countries as compared to developed countries as shown by study by Zablockis et al [42] conducted in Lithuania. Their study showed that malignant pleural effusion was seen in 16.5% of patients whereas parapneumonic etiology was found only in 13% of patients. This can be

explained by longer life, higher exposure to risk factors, eating more fatty foods, obesity and lower pregnancy rates in developed country.

Among 15 patients of parapneumonic effusion, 4 patients (17.3%) had uncomplicated & 11 patients (47.8%) had complicated parapneumonic effusion. Empyema was present in 8 patients (34.8%), among which only 1 was tubercular and rest were bacterial empyema. It was concordant with study by Porcel et al [22] which showed 34.7% were uncomplicated Parapneumonic effusion, 37.1 were complicated pleural effusion and 28.2 % were empyema. In a study by Singh et al [43], it was found that there were 48% of patients had uncomplicated parapneumonic effusion, 42% had complicated parapneumonic effusion and 10% had empyema. Our study had a greater number of patients with complicated parapneumonic effusion and empyema. This is primarily due to higher number of patients with complicated effusion getting referred and admitted to our institute as it is a tertiary care hospital.

Among transudative pleural effusion, Heart failure (HF) was leading cause (n=8, 6.9 %).Out of 8 patients with HF, 7 were HFrEF and 1 had HFnEF. 5 patients out of 8 had accompanying chronic kidney disease (CKD). In a study by Maikap et al [44], CCF (2%) was the most common cause among transudative group whereas tuberculosis (68.8%) was most common cause in exudative group. In a study Dhital et al [18], among transudative pleural effusion, heart failure was the most common cause (8%).

8 patients (6.9%) had multiple etiologies, among which heart failure was the most common cause in our study. This is concordant with a study by Bintcliffe et al[10], 38 patients had more than one cause, of which the most common was congestive heart failure (n = 21, 51%).

It was found in our study that most of the effusions showed lymphocyte predominance (n=90; 76.7%) on cytological analysis of pleural fluid. Etiology of pleural effusion among the lymphocytic predominant subset of pleural fluid was tubercular in 44.8% (n=52) of patients, malignant in 10.3% (n=12) of patients and HFrEF and CKD in 4.3% (n=5) of patients. Among the neutrophil predominant subset of

pleural fluid, the most common cause was found to be parapneumonic effusion in 11.2% (n=14) of patients and empyema in 4.3% (n=5) of patients. A study by Bar et al [45] concluded that predominantly lymphocytes are commonly found in tubercular pleural effusion and predominantly polymorphs are commonly found in parapneumonic effusion and empyema, which is concordant with our results. Similar results were found in a study by Al-Alusi et al [39] which concluded that in both tuberculous and malignant effusions the cellular content of the fluid was predominantly lymphocytic.

On biochemical analysis of pleural fluid, it was found that glucose ranged between 0 to 381 mg/dl with mean pleural fluid glucose value of 109.9 ±76.14. 2 patients had pleural fluid glucose 0 mg/dl, among which 1 patient had complicated parapneumonic effusion and 1had empyema. Mean pleural fluid glucose value was minimum for empyema (mean 37.5 ± 54.4 mg/dl) and parapneumonic effusion (mean 67.40 ± 74.24 mg/dl). In a study by Reddy [33], parapneumonic effusion group had minimum pleural fluid glucose (31.2 ± 24.6 mg/dl).

More than 3 g/dl of mean pleural fluid protein was seen in tubercular pleural effusion (mean 4.98 ± 1.21 g/dl), parapneumonic effusion (mean 4.25 ± 0.96 g/dl) and malignant pleural effusion (mean 4.02 ± 0.89 g/dl). A study by Dhital et al [18] showed similar results.

Higher pleural fluid LDH (pleural fluid to serum LDH ratio more than 2) was seen in patients with empyema (n= 7/7, 100% among its own group), parapneumonic (n=13/15; 87% among its own group), malignancy (n= 9/12; 75% among its own group) and tuberculous pleural effusion (n=27/53; 51% among its own group). Pleural fluid LDH was low in effusion due to heart failure and CKD. Similar results were seen in a study by Dhital et al [18], which concluded that raised level lo LDH was seen in inflammatory conditions like tuberculous and parapneumonic effusion and low in other conditions like congestive heart failure and liver disease.

Mean value of pleural fluid ADA in our study was 95.87 ± 92 IU/L. Individually tuberculous, parapneumonic and malignant pleural effusion had mean ADA value of 140.91± 84.69 IU/L, 94.71 ± 118.53

IU/L and 37.62 ± 79.47 IU/L respectively. Tuberculous pleural effusion (98.1%) had ADA value >40IU/L (p value 0.001) whereas most of malignant pleural effusion (75%) had ADA value <40 IU/L (p value 0.01). A study done by Goto et al [46] showed that there was a statistically significant difference according to the levels of pleural fluid ADA between tuberculous pleural effusion and malignant pleural effusion group and confirmed that ADA is a very useful parameter for the differentiate tuberculous and malignant pleural effusion. Another study by Raghavan et al [35] showed that all cases of tuberculous effusion had pleural fluid ADA > 40 IU/L and most of the malignant effusions had ADA level of <30 IU/L.

Cutoff value of >40 IU/L of ADA had sensitivity of 75.4%, specificity of 97.7%, PPV of 98.1% and NPV of 71.7% for diagnosing tuberculous pleural effusion. A study by Shashikant et al [23] concluded that if ADA>70 IU/L was taken as cut off, it was exclusively seen in case of tubercular pleural effusion with an accuracy of 99%, sensitivity of 100% and specificity of 98.6%. Another study by Reddy et al [33] showed that >30 IU/L of ADA cutoff value had 92% sensitivity, 100% specificity, 1.00 PPV and 0.85 NPV for diagnosis of tuberculous pleural effusion.

Two main diseases other than tuberculous pleuritis [47] that are associated with a high pleural fluid ADA are empyema and rheumatoid pleuritis but latter two diseases do not have pleural fluid lymphocytosis. Pleural fluid L/N ratio of >0.75 increases the specificity for diagnosing tubercular pleuritis. Tuberculous pleural effusion (n=52; 98% among its own group), malignant pleural effusion (n=12; 100% among its own group), HFrEF and CKD (n=5, 100% among its own group) and pancreatic pleural effusion (n=4; 100% among its own group) had pleural fluid L/N ratio of >0.75 in our study. Sensitivity and specificity of pleural fluid L/N ratio of >0.75 to diagnose tuberculous pleural effusion was 56.52% and 95.83% respectively.

When ADA & L/N ratio were analyzed simultaneously, it was found that 98% (n=52) of patients with ADA >40 and L/N ratio >0.75 had tubercular etiology. The sensitivity and the specificity rise up to

89.7% and 98.3% respectively. Hence along with ADA, clinical evaluation, lymphocyte to neutrophil ratio and glucose levels are necessary to separate these entities.

Tuberculin skin test (TST) was positive only in 28.3% patients (n=15/53) of tuberculous effusion. In a study by Mohan et al [16], TST was negative in majority of diagnosed cases of tubercular pleural effusion, which is concordant with our study. A study by Raghavan et al [35] found that TST was positive in 61.10% of patients with tuberculous effusion which is contrary to our findings. As test was not conducted in 37.1% (n=43) of patients and 5.2% (n=6) of the patients got discharged before reading of TST could be taken, the number of patients with positive TST were less in our study.

Pleural fluid CBNAAT was performed in 112 patients. Out of which 9 were positive and 103 were negative. It was seen that sensitivity of CBNAAT in tubercular pleural effusion in our study was 16.67%. Similar results were seen in a study by Chakraborty et al [48] where sensitivity of CBNAAT in tubercular pleural effusion was between 22.7- 51.4%. A study by Biswas et al [49] concluded that sensitivity and specificity of CBNAAT was 4.76% and 87.5% respectively for tubercular pleural effusion. Poor sensitivity was attributed to paucibacillary nature of tubercular pleural effusion.

In our study, 13.2% (n=7/53) had past history of tuberculosis. In a similar study done in Ahmadabad by Parikh et al [19], among 62 patients of tuberculous effusion 4 patients (6.5%) had past history of tuberculosis.

Carcinoma lung 2.6% (n=3) and carcinoma breast 2.6% (n=3) were the most common primary responsible for malignant pleural effusion in our study. Other primary with malignant pleural effusion in our study were renal cell carcinoma (n=2; 1.7%), carcinoma ovary (n=1; 0.9%), carcinoma pancreas (n=1; 0.9%), carcinoma gall bladder (n=1; 0.9%) and carcinoma of unknown primary (n=1; 0.9%). 1 out of 3 patients with carcinoma lung had adenocarcinoma variant on histopathology. In a study by Porcel et al [22], lung (37%) and breast (36%) carcinoma was the most common tumor presenting with

malignant pleural effusion. Their study also concluded that cytology had accuracy of 51% to diagnose malignant pleural effusion. Another study by Valdes et al [21] found that the most frequent locations of the primary tumor among the neoplastic effusion group were lung (32.6%), breast (11.5%) and lymphoma (10.8%).

Malignant cell pleural fluid cytology was positive in 58.3% (n=7/12) of patients with malignant pleural effusion in our study. A study by Prakash et al [24], found that malignancy as the cause was established by cytology in 57% of the patients only, which is consistent with our study. In a study by Al-Alusi [39] et al, malignant cells were positive in 15 (60%) out of 25 patients of malignant effusion.

Pleural fluid cultures revealed growth of organisms in 45.5% (n-10/22) of patients with parapneumonic effusion and empyema. In a study by Hirsch et al [31], bacterial culture results were positive in 39% of patients, which was similar to our microbiological yield. In a study by Porcel et al [22] only 30% of cultures yielded positive results in infectious pleural effusion. Our microbiological yield was less as compared to a similar microbiological study by Brook et al [50]. The low yield of pleural fluid and sputum culture positivity is one of the limitations of this study. This could be attributed to prior antibiotic use as this study was conducted in a tertiary care hospital.

Most common organism isolated from pleural fluid culture was Staphylococcus aureus (n=4*, 3.4%; * 2 were MRSA). Other organisms isolated were Burkholderia (n=1, 0.9%), Pseudomonas (n=1, 0.9%), Klebsiella (n=1, 0.9%), Sphingomonas (n=1; 0.9%), VRE (n=1, 0.9%) and Candida (n=1, 0.9%). There was growth of contaminants like Staphylococcus epidermidis and hemolyticus in 3 (2.6%) patients. In a study by Singh et al [43], MRSA (4%), Pseudomonas (4%), Acinetobacter (2%), E. coli (2%) and Peptostreptococcus (2%) were isolated from pleural fluid culture. Another study in the United Kingdom by Chapman et al [51] showed that bacteria commonly isolated from empyema were Staphylococci, Enterobacteria, Enterococci and Pseudomonus aeruginosa.

Patients with tubercular pleural effusion were comparatively younger as compared to patients with malignant and parapneumonic pleural effusion. Mean age of patients with tubercular, malignant and parapneumonic pleural effusion was47.9 years, 52.7 years and 56.6 years respectively. A study by Parikh et al [19] found that tubercular pleural effusion was more common in young patients whereas malignant pleural effusion was more common in old age patients, which was concordant with our study. It was observed in their study that most of the patients with tuberculous effusion belong to age group of 21-50 years.

It was observed that right sided pleural effusion (57.8%) was more common as compared to left sided pleural effusion (42.2%). Most of the unilateral pleural effusions (n= 64*, 55.2%; * including 20 secondary pleural effusions) were found to be mild both clinically and radiologically. In a study by Raghavan et al [35] in Kerala, 66% of patients had right sided effusion and 52% of patients had mild pleural effusion.

Another study by Dhital et al [18] and Selvamani et al [38] concluded hat unilateral pleural effusion was most common on right side. The possible explanation is right lung is larger and have more pleural surface area hence more secretion of pleural fluid. Right bronchus is vertical and in line with trachea than left; thus infectious material tends to enter right lung more leading to local pathology and pleural effusion. Major opening like vena-caval hiatus as well as minor openings is more numerous in the right hemi-diaphragm than on the left side.

In our study tubercular and malignant pleural effusion were found to be more common on right side (62.26% & 58.33 % among own group). A study by Bar et al [45] in West Bengal showed that both tubercular and malignant pleural effusion cases were more commonly observed in the right side (65.97% and 68.18% among own group).

Loculated pleural effusion was present in 19 (16.4%) patients in our study. In a study by Desalew et al [36] loculated effusion was found in 2.7% of patients only. It can be explained by more number of

patients with complicated parapneumonic effusion and empyema in our study.

Hematocrit level was determined for all patients and 74 patients (63.8%) had anemia. Similar results were seen in a study by Desalew [36] where 64 (66%) patients had anemia. The reason might be high prevalence of malnutrition in our country which leads to anemia and is a risk factor for tuberculosis itself.

ATT, antibiotics, antifungal, chemotherapy, decongestive therapy and supportive treatment were given to 55 (47.4%), 35 (30.17%), 6 (5.17%), 4 (3.45%), 12 (10.3%) and 14 (12.06%) patients respectively. Therapeutic aspiration and chest tube drainage was done in 26 (22%) and 40(35%) patients respectively. Further Streptokinase insertion and VATS with broncho-pleural fistula closure was required in 14 (12.06%) and 1 (0.9%) patient respectively.

Desalew et al [36] conducted a prospective study at tertiary teaching hospital in a resource limited area, Ethiopia. As per their study anti-tuberculosis and antibiotics were given to 79 (71.8%) and 72 (65.5%) patients respectively. Chest tube drainage was done in 25 (22.7%) patients. In this study comparatively higher proportion of patients were given ATT and antibiotic because of non-availability of advanced tests like adenosine deaminase (ADA), pleural biopsy etc. Due to lack of sustained pathology service, fluid cytology reports were also not complete. So empirical anti-tuberculosis therapy was given in patients with undiagnosed pleural effusion. Surgical intervention was not done in any patient. Availability of better health care facility in our country as well as sophisticated investigations available at our institute was the primary reason of a greater number of patients undergoing radiological and surgical intervention.

Out of the 116 patients, 98 (84.5%) patients were discharged and 18 (15.5%) went DAMA. There had been no mortality. Mean length of stay in hospital was 11.3 days.

97.8% of patients of tubercular pleural effusion improved in our study. A study by Lokesh et al [52] found that 80% patients with tubercular pleural effusion treated with ATT improved. Another study by

Leah et al [53] concluded that most of the patients improved and became afebrile within 2 weeks.

In our study 2 (3.9%) patients showed ATT induced hepatitis. 8 (15.6%) patients were readmitted with fever which on evaluation was found to be because of empyema (n=4, 3.4%), pneumonia (n=2, 1.7%), pott spine (n=1, 0.9%) and urinary tract infection (n=1, 0.9%). 2 (1.7%) patients required repeat therapeutic tap. One patient (0.9%) developed hydro-pneumothorax. 2 patients showed improvement in spite of stopping ATT on follow up. One patient (0.9%) was later diagnosed with carcinoma lung.

Malignant pleural effusion had high mortality rate of 41.6 % (n=5/12) and 75% (n=9/12) at 2 months and 4 months follow up respectively. A Study by Heffner et al [54] showed that median survival of patient with malignant pleural effusion was 4.0 months. Another study by Psallidas et al [55] concluded that patients with malignant pleural effusion had median survival ranging from 3 to 12 months and mostly the management remained palliative.

Mortality among the patients with parapneumonic effusion and empyema was 9.5% (n=2/21). Complicated parapneumonic effusion and empyema had higher mortality rate as compared to uncomplicated parapneumonic effusion. A study by Singh et al [43] found that mortality is highest amongst complicated parapneumonic effusion and empyema.

An obvious limitation of the study was that the number of patients was 116 only and duration is only one year, which could limit the general applicability of our findings to the larger community setup. However our study collaborates well with the other study and shows various mode of clinical presentation and importance of thoracocentesis followed by pleural fluid analysis in diagnosing the underlying etiology of unilateral pleural effusion.

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SUMMARY AND CONCLUSIONS

1. Over a period of 1 year (January 2019 to December 2019), 116 patients admitted with unilateral pleural effusion as per the inclusion criteria were prospectively observed.
2. Maximum number of patients (63.8%) were in the age group of 20 to 60 years.
3. 81 (69.8%) patients were males and 35 (30.2%) patients were females. The male to female ratio was 2.3:1.
4. The average duration of stay in hospital was 11.3 days.
5. Most common presenting symptoms in our study was shortness of breath (n=65, 56%), fever (n=62*; 53.4%; *including 23 patients with evening rise in temperature), cough (n=61, 52.5%), chest pain (n=41, 35.3%), anorexia (n=40, 34.5%) and weight loss (n=22, 18.9%).
6. Most of the pleural fluids were straw coloured followed by blood stained, clear, yellow and turbid and puss coloured. There was no chylous pleural fluid.
7. There were 99 patients (85.3%) had exudative and 17 patients (14.6 %) had transudative effusion.
8. Among exudative, tuberculous pleural effusion was the most common cause (45.7%) followed by parapneumonic (12.9%), malignant (10.3%), empyema (6.1%), pancreatic (3.4%), hemothorax (2.6%) and effusion reactionary to abdominal surgery (0.9%) patients. Etiology was unknown in 3.4% patients.
9. Among parapneumonic effusion, there were more number of patients with complicated parapneumonic effusion and empyema than uncomplicated one.
10. There were more number of patients with lymphocytic predominance (76.7%) on cytological analysis of pleural fluid.
11. Tubercular (44.8%) and malignant (10.3%) was common etiology among the lymphocytic predominant subset of pleural fluid. Parapneumonic effusion (11.2%) and Empyema (4.3%)

was common etiology among the neutrophil predominant subset of pleural fluid.

12. Right sided pleural effusion is more common overall (57.8%) as well as among tubercular and malignant pleural effusion.
13. Most of pleural effusions (n= 64*, 55.2%; * including 20 secondary pleural effusions) were found to be mild overall as well as among tuberculous pleural effusions. Highest proportion of large size pleural effusion seen in malignancy.
14. Along with ADA, lymphocyte to neutrophil ratio >0.75 increases sensitivity and the specificity to diagnose tuberculous pleural effusion.
15. Carcinoma lung (2.6%) and carcinoma breast (2.6%) were the most common primary responsible for malignant pleural effusion.
16. Most common organism isolated from pleural fluid culture was Staphylococcus aureus.
17. Patients with tubercular pleural effusion were comparatively younger as compared to patients with malignant and parapneumonic pleural effusion.
18. The aetiological distribution of pleural effusion depends on the patient's age, and advances in diagnosis and treatment of the underlying cause.
19. Most of the effusions resolve with treatment of the underlying cause especially tuberculous pleural effusion. But treatment remained palliative in patient with malignant pleural effusion.
20. Determining the aetiological and clinical pattern of pleural effusion helps in adoption of optimized diagnostic and therapeutic attitudes.

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KEY TO MASTER CHART

Address
Urban -1
Rural-0

Ward / ICU
Ward- 0
ICU- 1

Gender
Female - F
Male - M

Outcome
DAMA-1
Death-2
Disch-3

Loculated Effusion
Yes - 1
No - 0

Side Of Pleural Effusion
Left-1
Right-2

Grade Of Pleural Effusion
Mild-1
Mod-2
Severe -3

Nature Of Pleural Effusion
Exudative-1
Transudative-0

Etiology-
Tubercular -1
Typical Parapneumonic-2
Simple Complicated Parapneumonic-3
Complex Complicated Parapneumonic-4
Malignant-5
Empyema-6
Pancreatic-7
Hemothorax-8
Reactionary To Abdominal Surgery- 9
Tubercular Empyema-10
Unknown Exudative-11
Hfref And CKD-12
CKD -13
Anaemia And Hypoproteinemia-14
Hfnef-15
Hfref-16
Corpulmonale -17
CLD -18
Hypothyroidism-19
Hfref, AKI And Hypoproteinemia-20
Unknown Transudative-21

Pneumonia
Present-1
Absent-0

Infective Causative Agent
Bact-1
Fungal-2
Viral-3
Unknown-4
Tubercular -5

Malignancy
Breast-1
Renal Cell Carcinoma (RCC)-2
Pancreas-3
Urinary Bladder-4
Gall Bladder-5
Ovary-6
Esophagus-7
Unknown-8
Lung-9

Pancreatitis
Present-1
Absent-0

Mediastinal LAP
Present-1
Absent-0

Cavitatory Lung Lesion
Abcess-1
Necrotising Cavitatory Pneumonia- 2
Multiple Cavities Likely Septic Emboli- 3

Post Abdominal Surgery
Present-1
Absent-0

Trauma
Present-1
Absent-0

AFI
Present-1
Absent-0

Tropical Fever
Present-1
Absent-0

UTI
Present-1
Absent-0

PUO
Present-1
Absent-0

Sepsis
Present-1
Absent-0

Shock
Present-1
Absent-0
MOF
Present-1
Absent-0

Fluid Overload
Cardiac-1
Renal-2
Hepatic-3
SVC Obstruction-4

Hepatitis
Absent-0
ATT Induced-1
Other Cause-2

Myelitis
Present-1
Absent-0

Infective Endocarditis
Present-1
Absent-0

PTE (Pulmonary Thromboembolism)
Present-1
Absent-0

Polyserositis
Present-1
Abs
Dyspnoe
Present-1
Absent-0

Dyspnoea – Increase On Exertion And Decreases At Rest
Present- 1
Absent- 0

Dyspnoea Severity
MMRC Grade -0
MMRC Grade -1
MMRC Grade -2
MMRC Grade -3
MMRC Grade -4

Cough
Absent -0
Dry -1
Productive -2

Sputum Colour
Purulent- 1
Green- 2
Black- 3
Blood Stained- 4
White- 5

Sputum Consistency
Thick-1
Thin-2

Haemoptysis
Present-1
Absent-0

Chest Pain
Present- 1
Absent -0

Chest Pain Site
Right Side -R L
Left- L

Chest Pain Radiation
0- No
1-Yes

Chest Pain – Sharp In Character
Present 1
Absent 0

Inc With Inspiration/ Dec With Expiration
Present-1
Absent-0

Onset Of Chest Pain
Insidious -1
Sudden-2

Course
Progressive- 1
Non-Progressive- 0

Severity
Mild -1
Moderate-2
Severe-3

Precipitating Factors: Deep Inspiration And Cough
Yes-1
No-0

Relieving Factors-Expiration
Yes-1
No-0

Fever
Yes-1
No-0

Fever
Continuous- 1
Intermittent- 0

Chills
Yes-1
No-0

Evening Rise
Yes-1
No-0

Night Sweats
Yes-1
No- 0

Anorexia
Yes- 1
No- 0

Weight Loss
Present- 1
Absent - 0

Palpitations
Present- 1
Absent -0

Fatiguability
Present- 1
Absent - 0

Chest Pain
Present- 1
Absent- 0

Nausea
Present- 1
Absent- 0

Vomiting
Present- 1
Absent- 0

Pain Abdomen –
Present- 1
Absent- 0

Site-
RUQ (Right Upper Quardrant)- 1
LUQ (Left Upper Quadrant)- 2
EPI (Epigastrium)-3
RLQ (Right Lower Quadrant)-4
LLQ (Left Lower Quadrant)-5
PU (Periumblical)- 6
SP (Suprapubic)- 7
GEN (Generalised)- 8

Intensity Pain Abdomen
Mild-1
Moderate-2
Severe-3

Relieving Factor-
Bowing Forward 1
Pain Killer-2

Abdominal Distension
Present 1
Absent 0

Jaundice
Present 1
Absent 0

Burning Micturition
Present 1
Absent 0

Increased Frequency Of Micturition –
Present- 1
Absent- 0

Decreased Urine Output-
Present- 1
Absent- 0

Headache
Present- 1
Absent- 0
Altered Sensorium
Present- 1
Absent -0

Seizures
Present 1
Absent 0

Hemiparesis
Present- 1
Absent- 0

History Of TB
Present -1
Absent-0

Past History Of
PTB (Pulmonary TB)-1
Abdominal TB-2
Disseminated- 3
Milliary-4
TBM-5
Extrapulm/Other-6

ILD
Present -1
Absent-0

Hypothyroidism
Present -1
Absent-0

Malignancy
Present -1
Absent-0

Malignancy Primary
Breast-1
RCC-2
Pancreas-3
Urinary Bladder-4
Gall Bladder-5
Ovary-6
Esophagus-7
Unknown-8

OSA
Present -1
Absent-0

Bronchial Asthma
Present -1
Absent-0

Pregnancy
Present -1
Absent-0

Coeliac Disease
Present -1
Absent-0

Seizure Disorder
Present -1
Absent-0

PLHIV
Present -1
Absent-0

IBD
Present -1
Absent-0

Corpulmonale
Present -1
Absent-0

Veg/Non-Veg
Non-Veg-1
Veg-0

Smoker
Yes-1
No-0

Alcoholic
Yes-1
No-0

Substance Abuse
Yes 1
No 0

Substance Abuse
Opioid- 1
Tobacco- 2

Menstrual History (Female Patients)
Irregular 2
Regular- 1
Menopause- 0

Temporal Ass With Respiratory Symptoms
Present- 1
Absent- 0

Sensorium
Alert- 1
Altered- 0

Icterus
Present- 1
Absent- 0

Cyanosis
Present- 1
Absent- 0

Pallor
Non-Pitting- 2
Present- 1
Absent- 0

Clubbing
Present- 1
Absent- 0

Edema
Non Pitting- 2
Pitting-1
Absent-0

Skin Rash
Present-1
Absent-0

LAP
Present- 1
Absent- 0

LAP-Region
Cervical -1
S/M (Submandibular)- 2
S/C (Supraclaavicular)- 3
Inguinal- 4
Axillary- 5

Trachea
Left-2
Right-1
Central-0

JVP Raised-1
Not Raised-0

Inspection -Decreased In Chest Rise
Present-1
Absent- 0

Side Of Dec Chest Rise
Right -R
Left-L

Decreased TVF
Present- 1
Absent - 0

Side Of Decreased TVF
Right- R
Left- L

Decreased Breath Sounds
Present- 1
Absent- 0

Side Of Absent Breath Sound
Right- R
Left- L

Site Of Dec Breath Sound
Infraxillary- 1
Interscapular -2
Axillary- 3
Inframammary- 4
Mammary- 5
Supramammary- 6
Infrascapular- 7

RS Percussion - Stony Dull Note
Present- 1
Absent- 0

Crepitations
Present- 1
Absent - 0

Laterality Of Crepitation
Unilateral-1
Bilateral-2

Site Of Crept
Infraxillary- 1
Interscapular -2
Axillary- 3
Inframammary- 4
Mammary- 5
Supramammary- 6
Infrascapular- 7
Scattered- 8

Bronchial Breath (BB) Sound
Absent- 0
Tubular- 1
Amphoric- 2
Cavernous -3
Side Of BB Sound
Left- 1
Right- 2

Site Of Bronchial Breath Sound
Infraxillary -1
Interscapular -2
Axillary- 3
Inframammary- 4
Mammary- 5
Supramammary- 6
Infrascapular- 7
Scattered- 8

Abdomen Tenderness
Present- 1
Absent- 0

Site-
RUQ (Right Upper Quardrant)- 1
LUQ (Left Upper Quadrant)- 2
EPI (Epigastrium)-3
RLQ (Right Lower Quadrant)-4
LLQ (Left Lower Quadrant)-5
PU (Peri- Umblical)- 6
SP (Suprapubic)- 7
GEN (Generalised)- 8

Bowl Sounds
Sluggish 2
Present 1
Absent 0

H'megaly
Present-1
Absent- 0

Spl
Present-1
Absent- 0

Shifting Dullness
Present-1
Absent- 0

Any Other Mass Palpable
Present-1
Absent- 0

Plantar
Flexor-0
Extensor-1
Mute-2
Withdrawl-3

CVS S1,S2
Present- 1
Muffled- 0

Added Sound S3,S4
Present 1
Absent 0

Murmur
Present-1
Absent- 0
Site Of Murmur Area
Aortic- A
Tricuspid - T
Mitral- M
Pulmonary- P

Gross Appearance
Straw-1
Yellow And Turbid- 2
Hemmorhagic- 3
Puss- 4
Chylous- 5
Clear- 6

Nature
Exudative-1
Transudative-0

Gram Staining: Microganism
Present-1
No Microrganism-0
Acid Fast Staining:
Present-1
Absent-0

CBNAAT
MTB Detected-1
Not Detected-0

LPA
Positive 1
Negative 0

M Cells - 1st Sample
Present-1
Absent-0

M Cell 2nd Sample
Present-1
Absent-0

M Cell 3 Rd Sample
Present-1
Absent-0

Pleural Fluid C/S-Growth
Present-1
Absent-0

Pleural Fluid C/S - Organism-
Staph Hemolyticus-1
Burkholderia-2
Klebsiella-3
Pseudomonas-4
Sphingomonas-5
MRSA-6
VRE-7
M. Tuberculosis-8
Fungal Candida-9
No Growth -10
Fungal Non Candida Species-11
Staph Aureus- 12
Staph Epidermidis-13

Pleural Biopsy AFB/TB PCR
Positive 1
Negative 0

Sputum G/S - Organism –
Present-1
Absent-0

Sputum- GPC IN PAIR
Present-1
Absent-0

Sputum Sputum- GPC IN CHAINS
Present-1
Absent-0

Sputum Sputum- GNB
Present-1
Absent-0

Sputum Sputum- GNCB
Present-1
Absent-0

Sputum ZN Stain
AFB Present-1
AFB Absent-0

Sputum KOH
Positive-1
Negative-0

Sputum KOH- Fungal Stain Organism –
Budding Yeast Like Cell -1
Hyaline Septated Hyphae-2

Sputum Nocardia
Present 1
Absent 0

Sputum Routine C/S : Growth
Present 1
Absent 0

Sputum Culture Organism-
E. Coli-1
Acinetobacter-2
Klebsiella-3
Pseudomonas-4
Sphingomonas-5
MRSA-6
VRE-7
M. Tuberculosis-8
Fungal-9
Not Known-10

Sputum Fungal C/S : Growth
Present-1
Absent-0

LN- FNAC ZN Staining/CBNAAT/Giant Cell Granuloma
Positive 1,
Negative 0

Lung Biopsy –
Adenocarcinoma 1
Granuloma-2
Other- 3

Widal
Positive-1
Negative-0

Dengue Serology
Positive-1
Negative-0

Dengue NS 1 Antigen
Positive-1
Negative-0

Malaria Antigen
Positive-1
Negative-0

Leptospira Serology
Positive-1
Negative-0

Scrub Typhus
Positive-1
Negative-0

Brucella
Positive-1
Negative-0

Anti HAV
Positive-1
Negative-0

Anti HEV
Positive-1
Negative-0

CXR Unilateral Pleural Effusion
Positive-1
Negative-0

CXR Side Of Pleural Effusion
Left -1
Right -2

Blunting Of Post CP Angle
Yes- 1
No- 0

Blunting Of Lat CP Angle
Yes- 1
No- 0

Meniscus Sign
Yes- 1
No- 0

Fluid In Fissures
Yes- 1
No- 0

Loss Of Diaphragmatic/ Cardiac Outline Opacification Of Hemithorax
Yes- 1
No- 0

Mediastinal Shift To Opposite Side
Yes- 1
No- 0

Consolidation
Yes- 1
No- 0

Cavitation
Yes- 1
No- 0

AFL
Yes- 1
No- 0

CXR Grade Of Pleural Effusion-
Mild- 1
Mod- 2
Severe- 3

Loculated Pleural Effusion
Yes- 1
No - 2

Usg Chest- Unilateral Effusion
Present-1
Absent-0

Usg Chest- Side Of Pleural Effusion
Left-1
Right- 2

Usg Chest-Grade Of Pleural Effusion
Mild- 1
Mod- 2
Severe- 3

Usg Chest- Sepatated
Present-1
Absent-0

Usg Chest Pleural. Thickening
Present- 1
Absent- 0

Usg Chest- Cons
Present- 1
Absent- 0

Usg Abdomen- Hepatomegaly
Present- 1
Absent- 0

Usg Abdomen- Splenomegaly (Spl)
Present- 1
Absent- 0

Usg Abdomen- RPCG
Present- 1
Absent- 0

Usg Abdomen-FF- Free Fluid
Present- 1
Absent- 0

CT Chest- Unilateral Effusion
Loculated- 1
Non Loculated- 2

CT Chest-Mass
Present- 1
Absent- 0

CT Chest-PTE (Pulmonary Thromboembolism)
Present- 1
Absent- 0

CT Chest-Pleural Thickening
Present- 1
Absent- 0

CT Chest-GGO (Ground Glass Opacities)
Present- 1
Absent- 0

CT Chest-Milliary Mottling
Present- 1
Absent- 0

CT Chest-Nodules
Present- 1
Absent- 0

CT Chest-Cavitatory Lesion
Single- 1
Multiple- 2
Absent-0

CT Chest-AFL
Present- 1
Absent- 0

CT Chest-Fibrosis/ Bronchietatic Changes
Present- 1
Absent- 0

CT Chest-Mediastinal LAP (Lymphadenopathy)
Present- 1
Absent- 0

CT Chest- Conso (Consolidation)
Present- 1
Absent- 0

Probable Etiology Based On CT Chest-
Tubercular- 1
Malignancy- 2
Others Or Unknown- 3

Echo- RWMA
Present-1
Absent-0

Echo-Global Hypokinesia
Present-1
Absent-0
Echo- LVH
Present-1
Absent-0

Echo-LV Diastolic Dysfunction
Present-1
Absent-0

Echo- MS/ Dilated LA
Present-1
Absent-0

Echo-RV Dysfunction
Present-1
Absent-0

Echo-RV Dil/ Inc PA Pressure/ Mild TR/PR
Present-1
Absent-0

Echo-Pericardial Effusion
Present-1
Absent-0

Medical Management
Antibiotic-1
ATT- 2
Chemotherapy- 3
Antifungal- 4
Supportive Or None-5
Decongestive Therapy-6

Chest Tube Or Pig Tail Insertion:
Yes-1
No-0

Stk (Streptokinase) Insertion:
Yes-1
No-0

Surgical Intervention - VATS
Yes-1
No- 0

2 Month, 4 Month And 6 Month F/U- Constitutional Features
Present-1
Absent-0
Lost To Follow Up-2
Died-3

Improvement In Previous Clinical Symptoms And Signs
Present-1
Absent-0

Appearance New Clinical Symptoms/Signs
Yes-1
No-0

| | | |

| | | | Genitourinar | | | | C | | | | | | Past History | | | | | |

0

36,63- 0

Investigations at Admission

ND ND

INVESTIGATIONS AT ADMISSION

| S. No. | Name | MRD No. | power UL | power LL | DTR | CVS S1,S2 | Added Sound S3,S4 | ESM, PSM, MDM, EDM | Site of Murmur | GCS | Hb (adm) g/dl | MCV (adm) | TLC (adm) | DLC (adm) P (%) | DLC (adm) L (%) | DLC (adm) E (%) | Platelet (adm) in thousands | ESR (adm) | PBF (adm) | LFT (adm) | Total bilirubin (adm) | Direct bilirubin (adm) | SGOT (adm) | SGPT (adm) | ALP (adm) | Total protein (adm) | Serum Albumin (adm) | INR/PT (adm) | Blood urea (adm) | Serum Creatinine (adm) | Na (Adm) | K (Adm) | Cl (adm) | Ca (Adm) | Mg (Adm) | Phos (adm) | Uric acid (adm) | CRP (adm) | BNP (adm) | Urine R/E (adm)- RBC | Urine R/E (adm)-puss cell | Urine R/E (adm)- proteinuria | AntiHIV(Rapid/ELISA) (adm) | AntiHCV (Rapid/ELISA) (adm) | HbsAg (Rapid/ELISA) (adm) | Mantoux test - | Connective tissue profile ANA /RF | d dimer | HBA1C | CM > 0.7 | fungitell >80 pg/ml | PCT | TSH | raised tumour marker- | Hb (dis) | MCV (dis) | TLC (dis) | DLC (dis)N | DLC (dis) L | DLC (dis)E | Platelet (dis) | ESR (dis) |
|---|---|---

36,63-

Investigations at Discharge

Investigations at Discharge

CULTURE & SENSITIVITY

SPUTUM / ET SECRETION/BAL ANALYSIS

| S. No. | Name | MRD No. | Total bilirubin (dis) | Direct bilirubin (dis) | SGOT (dis) | SGPT (dis) | ALP (dis) | Total protein (dis) | Serum Albumin (dis) | INR@T (dis) | Blood urea (dis) | Serum Creatinine (dis) | Na (Dis) | K (Dis) | Cl (dis) | Ca (Dis) | Mg (Dis) | Phos (dis) | Blood C/S Bacterial no | Blood C/S Bacterial - | Blood C/S Fungal- | Blood C/S Fungal- organism | Urine C/S Bacterial | Urine C/S Bacterial-organism | Urine C/S Fungal | Urine C/S - organism | Exu-1, Transu-0 | Gross appearance: | pH | Fluid Albumin | Fluid protein | Serum protein | Ratio Pf protein/ serum. protein | Fluid LDH | Serum LDH | Ratio | Fluid glucose mg/dl | pf TLC | pf DLC- MNC | pf DLC - N | Ratio - L/N | DLC RBC | Gram staining: | G/S- GNB | G/S-GNCB | G/S-GPC | G/S- Puss cell | Acid fast staining: | CBNAAT: | LPA | ADA | ANA | RF | Flow cytometry for diagnosis of lymphoma | M cells - 1 st sample- | M cell 2 nd sample- | M cell 3 rd sample- | Pleural fluid c/s-growth | Pleural fluid C/S - Organism- staph | PF - other | PLEUAL BIOPSY AFB/TB PCR | Sputum C/S - organism | GPC IN PAIR | GPC IN CHAINS | GNB | GNCB | ZN stain | KOH | KOH- fungal stain organism | Nocardia | Routine C/S : growth culture Organism- growth | Fungal C/S : growth | CBNAAT | LPA | LJ Medium | LN -FNAC ZN staining/CBNAAT/giant cell granuloma |
|---|---|---

36,63-

Infection related assays

Chest X Ray

USG Chest

USG Abdomen

S. No.	Name	MRD No.	LN-Biopsy	LUNG BIOPSY -	Others	Widal:	Dengue serology:	Dengue NS 1 antigen :	Malaria antigen:	Leptospira serology :	Scrub typhus:	Brucella:	Anti HAV:	Anti HEV	pleural effusion	CXR-Blunting of post CP angle	CXR- Blunting of lat CP angle	CXR-Meniscus Sign	CXR-Fluid in Fissures	CXR-Loss of diaphragmatic/ Cardiac outline opacification of hemithorax	CXR-mediastinal shift to opposite side	CXR-conso	CXR-cav	CXR-AFL	CXR-eff	usg chest- side of pleural effusion	usg chest-Grade of pleural effusion-	usg chest- sepatated:	usg chest- pl. thickening	usg chest- cons	usg abdomen- hepa	usg abdomen-hepa(cm)	usg abdomen- spl	usg abdomen- RPCG	usg abdomen-FF- Free fluid	usg abdomen- other finding	CT chest- PE loculated	CT chest-mass	CT chest-PTE	CT chest-pleural thickening	CT chest-GGO	CT chest-miliary mottling	CT chest-nodules	CT chest-cavitatory lesion	CT chest-AFL	CT chest-fibrosis/ bronchietatic changes	CT chest-mediastinal LAP	CT chest-conso	probable etiology based on CT chest- other	MRI
1	JS	642924	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	1	1	0	1	1	-	0	0	0	-	-	-	-	-	1	-	-	-	1	-	-	2	-	-	1	1	3	-	-
2	J	649024	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	1	0	0	1	2	1	0	0	0	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	1	3	-	-
3	BR	648135	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	1	0	0	-	-	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	CR	645397	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	-	-	-	-	1	bulky head of panc with PPC	2	-	-	-	-	-	-	-	-	-	-	3	ANP WITH PPC	-
5	YD	669515	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	1	0	1	1	2	2	1	0	1	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	3	-	-
6	GS	668562	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MRI spine L3-4 spondylodiscitis with small paravertebralsoft tissue component
7	GK	675752	-	endobronchial biopsy- normal	liver biopsy- metastatic adenocarcinomatous deposits likely from lung	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	2	-	-
8	GS	680205	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CT W/A - AAST liver injury grade 3; left adrenal hemartoma ; thickened peripancreatic stranding ?pancreatitis	MR spine- multiple compression fracture of dorsal vertebrae, normal signal intensity of cord. PLC injury. Hematoma in s/c plane in cervical region.
9	SS	675282	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	-	-	-	-	-	-	2	0	-	-	-	-	0	-	-	-	0	3	-	-
10	NR	679044	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	BJ	639833	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Head: hmrgic contusion of left PT region; Mass effect 7mm	-
12	PV	667076	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	1	-	2	-	-
13	MS	178931	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	3	-	-
14	JS	862450	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	2	2	1	0	0	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	1	-	1	-	-
15	B	691410	-	0	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	Pleural Based Thickening in left MAL abutting left lower ribs with adjacent collections	1	1	-	-	-	-	-	-	-	-	-	-	2	-	-
16	NS	424860	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	1	2	2	0	0	0	-	-	1	-	-	echotexture changes of liver	2	-	-	-	-	-	-	-	-	-	1	-	1	-	-
17	S	689802	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	2	2	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	RK	696303	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	GCN	283651	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	-	-	-	-	-	0	-	0	1	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
20	PK	576549	-	lung cavity biopsy - lung abcess, adjacent lung parenchymal features s/o resolving pneumonia	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	1	-	1	-	3	-	-
21	VK	584710	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	SS	705149	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	1	0	0	-	1	3	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	AS	697995	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	2	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	NR	721974	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	1	0	0	0	1	1	3	0	0	0	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
25	SL	716103	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1	-	-
26	HS	686662	-	-	-	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0	2	-	-	-	-	-	-	1	-	-	1	-	1	-	-
27	VG	727650	-	non small cell carcinoma- adenocarcinoma	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	0	0	0	0	0	-	-	-	-	-	0	-	0	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	1	-	1	-	-

36,63-

0 0

2D Echo

2 month follow up

S. No.	Name	MRD No.	Other investigations	RWMA-	global hypokinesia-	EF	LVH	LV diastolic dysfunction	MS/ dilated LA	RV dysfunction	RV dil/ inc PA pressure/ mild TR/PR	pericardial effusion	other echo finding	Outside reports	therapeutic tap	Medical management-	chest tube or pig tail insertion:	Sx intervention - VATS	stk ins:	Constitutional features :	Improvement in previous clinical symptoms and signs : :	Appearance new clinical symptoms/signs	new symptoms	TLC	DLC	Hb	platelet	B(T)	B(D)	SGOT	SGPT	ALP	T.prot	albumin	Urea	Creat	Na	K
1	JS	642924	-	0	0	60	1	0	-	0	-	-	-	ct- septic emboli(staph)/fungal/tubercular; sputum - AFB neg, multiple BYLC with pseudohyphae	0	1,4	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	J	649024	-	0	0	60	-	0	-	0	-	-	-	-	0	1	0	-	0	1	0	1	SOB	24	76/21	11.4	345	-	-	-	-	-	-	-	-	-	-
3	BR	648135	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	0	1	0	0	fever, chest pain	10	74/19	12	217	-	-	-	-	-	-	-	-	-	-
4	CR	645397	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	0	0	1	0	-	7	-	9.4	273	0.33	0.12	20	19	-	7.2	4.8	13	0.7	138	4.2
5	YD	669515	-	-	-	-	-	-	-	-	-	-	-	tap done outside: TLC/MNC/N-2300/78/16, Prot 4.1, alb 1.9, ADA 67	0	2	1	-	0	1	1	0	-	11.5	92/12	13.2	392	0.5	0.3	29	24	55	7.1	4.2	14	0.82	139	3.8
6	GS	668562	-	0	1	40	-	1	-	0	-	-	-	-	0	1	1	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	134	5.7	131	4.6
7	GK	675752	-	-	-	-	-	-	-	-	-	-	-	CT Chest=R Side HPnTx with splitpleuralsign ?Mets Tap - hmg'ic fluid - exudative/ADA- 28 ; ATT started outside since 1.5 mths	0	3	1	-	0	1	0	1	Inc in SOB and chest pain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	GS	680205	-	0	0	60	-	0	-	0	-	-	-	-	0	1	1	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	SS	675282	-	0	0	60	-	0	-	0	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	18	24	-	-	-	-	-	-	-
10	NR	679044	-	1	0	29	-	1	-	0	1	-	-	-	0	1,4	1	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	BJ	639833	-	-	-	-	-	-	-	-	-	-	-	-	1	6	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	PV	667076	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	MS	178931	-	0	0	60	-	1	-	0	-	-	-	-	0	1,4	1	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	JS	862450	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	B	691410	-	-	-	-	-	-	-	-	-	-	-	-	1	3	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	NS	424860	-	1	0	40	-	-	-	0	-	-	-	-	0	2	0	-	0	1	1	0	Burning Micturation, Dec in Urine Output	10.9	70/15/2.3	10	167	-	-	180	104	-	-	-	-	-	-	-
17	S	689802	-	0	0	60	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	34	23	-	-	-	-	-	-	-
18	RK	696303	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	-	-	-	24	18	-	-	-	-	-	-	-
19	GCN	283651	-	0	1	42	-	0	1	0	1	-	-	60ml/ Amber Turbid P/f; TLC 1070, P:10%; L-90%, Mature L, No M-cells; ADA 46.7: HRCT Chest: PE with soft tissue density, Anterobasal seg of Right Lower Lobe ? Consolidation. Pt started on ATT	0	2	0	-	0	1	0	1	fever	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	PK	576549	-	-	-	-	-	-	-	-	-	-	-	-	0	1,4	1	-	0	1	0	0	fever	10.9	78/21	9.5	214	-	-	-	-	-	-	-	-	0.9	-	-
21	VK	584710	-	0	0	60	-	-	-	-	-	1	-	Pf Protein-5.25; Sugar 144; LDH 259, ADA 85, ZN No AFB	1	1	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	SS	705149	-	0	0	38	-	0	-	-	1	-	-	Pf 50ml Diagnostic tap, Gross Yellow, Cytology TLC 2550, DLC MNC 30% N 70%, No M Cell; Biochem Proteins 3.3, Sugar 147, ADA 46.32	0	5	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	AS	697995	-	-	-	-	-	-	-	-	-	-	-	-	0	5	1	-	0	0	1	1	pain at site of chest tube insertion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	NR	721974	-	0	0	60	1	1	-	1	1	1	-	CXR- massive left side pleural effusion	1	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	SL	716103	-	0	0	60	1	0	-	1	-	-	-	-	0	1	1	-	0	0	1	1	dec mobilsation and easy fatiguability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	HS	686662	-	0	0	60	-	0	-	0	-	-	-	-	0	2	0	-	0	0	1	0	-	15.5	74/13/7/4	13.6	468	-	-	9	66	-	-	-	-	0.52	-	-
27	VG	727650	-	0	0	60	-	0	-	0	-	-	-	-	1	1,2,4	0	-	0	1	0	1	SOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

										F/U 4 month													F/U 6 Months					
S. No.	Name	MRD No.	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance of new clinical symptoms/signs	new clinical symptoms/signs	Investigations	TLC	Hb	platelet	creatinine	B(T)	SGOT	SGPT	ALP	T.prot	albumin	creatinine	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs	Appearance of new clinical symptoms/signs	new symptoms	others
1	JS	642924	-	galactomannan- 7, ct with antifungal for 6 weeks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	J	649024	-	usg review - moderate PE with thick septation ; CXR - R mod PE with LZ hazziness ; PCD inserted with STK	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CXR- Mild R CP angle blunting	0	1	0	0	-
3	BR	648135	Left sided PE	CRP-85, usg chest- left side pleural effusion with internal echoes, pig tail inserted and IV antibiotic ct	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
4	CR	645397	-	TSH- 5.2	0	1	0	-	readmission for lap chole	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
5	YD	669515	-	readmitted with fever- iv antibiotic	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	R side CP angle blunting	-	0	1	0	0	completed and stopped ATT
6	GS	668562	R side pleural thickening	readmitted for dialysis	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
7	GK	675752	CXR- R side HPnTx , drain can be seen in situ ; HPE- metastatic adenocarcinomatous deposits from lung ; started on chemotherapy	-	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	CXR- mild R CP blunting	ct with oncology treatment	4	-	-	-	-
8	GS	680205	-	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
9	SS	675282	slight blunting of L cp angle	-	0	1	0	-	-	-	-	-	-	-	15	32	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
10	NR	679044	pt got intubated outside and expired because of sepsis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	BJ	639833	mod PE	pt on recurrent dialysis	1	0	1	persistence of SOB	-	-	-	-	-	-	-	-	-	-	-	-	severe PE	expired because of chest infection	-	-	-	-	-
12	PV	667076	PET CT: FDG Avid Left Lung MS, C, D Surface of Pleura-? Pleural Mesothelioma; LN(M,abd)& Lytic skeletal lesions likely Metastatic; Moderate LEFT PE with Chest Drain in situ. Adv HPE corelation.started on palliative chemotherapy.	-	1	0	0	persistence of SOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
13	MS	178931	CXR- mild L CP angle blunting	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
14	JS	862450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	B	691410	LLL mass, no PE	-	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	-	-
16	NS	424860	readm with fever, burning micturition ; urine & blood C/S- E.coli	-	1	0	1	left flank pain	NCCT KUB- bulky left kidney witj mild HUN, perinephric, periureteric stranding; USG abd- mild L HUN , urine r/e- 20 puss cell c/s-E.coli TLC 12.9 with 89P; DJ stenting was done	-	-	-	-	-	112	85	-	-	-	-	N	ct with mod ATT	0	1	0	0	completed and stopped ATT
17	S	689802	N	-	0	1	0	-	-	-	-	-	-	-	21	46	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
18	RK	696303	CXR- Mild pleural fluid in R side along posterolateralmargin. Ct ATT	-	0	1	0	-	ATT Stopped now in aug after 9 months in v/o persistence of pleural fluid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	GCN	283651	repeat adm for R side PE; repeat tap/ EXU/L pred -tlc - 500 (95/5/10000), prot- 3.8 /ratio -0.9,alb-1.87, glu 78, LDH Ratio-0.9 c/s- no growthCBNAAT- no mtb,no afb , montoux- 0 mm induration 2d echo- GHk ef-30%, fibroscan S0F2	-	0	1	0	-	pt stopped taking ATT in spite in spite of persistence of pleural effusion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	PK	576549	CT f/u - large thick walled cavitatory lesion with AF level in right UL with PCD in situ. Pleural thickening seen along the sup seg of R upper obe . Few LN paratracheal and subcarinal region; TLC-10.9 with 62 % poly ; chest drain c/s-klebsiella	ESR-85, repositioning of drain was done and flushing was advised along with ct of iv antibiotic	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	no cavitatory lesion seen	-	0	1	0	-	-
21	VK	584710	CXR:only Right side CP Angle Blunting	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
22	SS	705149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	AS	697995	CXR- no e/o PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
24	NR	721974	Blunting if L CP Angle & carophranic angle, Diaphragmatic border obscure, mild L PE & Trachea central	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
25	SL	716103	no e/o PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
26	HS	686662	N	ESR-22	0	1	0	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
27	VG	727650	on geftinib from outside hospital . Died d/t respiratory distress	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-

| S. No. | Name | MRD No. | Urban/ Rural | Age (Yrs) | Adm. No. | Ward/Unit | Ward/ ICU | Gender : F/M | DOA | DOD | Outcome: DAMA / Death/ Disch | Pleural effusion Loculated | side of effusion | Grade | nature of pleural effusion | Etiology | Pneumonitis | Pneumonia causing agent | Malignancy primary | Pancreatitis | Mediastinal LAP | Cavitatory Lung Lesion | Polyserositis | Post Abdominal Surgery | Trauma | AFI | Tropical Fever | UTI | PUO | Sepsis | Shock | MOF | Fluid Overload | Hepatitis | Myelitis | Infective Endocarditis | PTE | LOS -Ward (day) | LOS- ICU(day) | LOS (days) | Duration of symptoms (in Days) | Dyspnoe | Dyspnoea – increase on exertion & decreases at rest | Dyspnoea Severity MMRC grade | Cough | Sputum vol: tsp/day | Sputum colour | Sputum consistency | Haemoptysis – Volume | Chest pain | Chest pain site | Chest pain – Radiation | Chest pain Character – Sharp | Chest pain- Inc with inspiration/ Dec with Expiration | Onset | Progressive Course | Severity | pain inc with inspiration & cough | pain dec with expiration | Previous episodes | Fever | Continuous /Intermittent | Chills | Evening rise | Night Sweats | Anorexia | Weight loss | Palpitations | Breathelessness (NYHA Grade) | Fatiguability or generalised weakness | Chest Pain | Others | Nausea | Vomiting | Pain abdomen | Site of pain | Duration (Days) | Intensity | Radiation of pain towards back | Aggravated by movement or deep inspiration | Relieving factor | Abdominal distension | loose stools | constipation | Jaundice | Others |
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| S. No. | Name | MRD No. | Burning micturition | Increased frequency of micturition | Decreased urine output | Others | Headache | Altered sensorium | LBA | Seizures | quadriparesis | Hemiparesis | Other(s) | TB | DM | HTN | VHD | CAD | CKD | CLD | Arthritis | CVA | COPD | TB- pulm/abdl/disseminated/miliary/ tbm/Extrapulm other-6 | ILD | Hypothyroidism | malignancy | malignancy | OSA | BA | Pregnancy | coeliac ds | seizure | PLHV | IBD | Conjutmonale | Veg/Non-veg | Smoker | Alcoholic | Duration (in Years) | Quantity (ml/day) | Substance abuse | Substance Abused | Menstrual history (female patients) | Temporal ass with respiratory symptoms | Sensorium | Icterus | Cyanosis | Pallor | Clubbing | Edema | Skin: Rash | LAP | LAP -Region | Trachea | JVP | Temperature (in F) | SBP (mm of Hg) | DBP (mm of Hg) | Pulse (in BPM) | RR (in per min) | Nutritional assessment - BW (in Kg) | Height (Ft) | Height (Inches) | BMI (in Kg/m2) | Respiratory system examination- Inspection - decreased in chest rise | side of dec chest rise | decreased TVF | side of decreased TVF | decreased breath sounds | side of absent breath sound | site of dec breath sound - | stony dull on percussion | side on dullness | Crepitation | laterality of crepitation | Site of Crept | type of bronchial breath (BB) sound | side of BB sound | site of bronchial breath sound - | Abdomen Tenderness | Site- | Bowl Sounds | H'megaly | spl | shifting dullness | any other mass palpable | site of mass | Plantar |
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| S. No. | Name | MRD No. | power UL | power LL | DTR | CVS S1,S2 | Added Sound S3,S4 | ESM, PSM, MDM, EDM | Site of Murmur | GCS | Hb (adm) g/dl | MCV (adm) | TLC (adm) | DLC (adm) P (%) | DLC (adm) L (%) | DLC (adm) E (%) | Platelet (adm) in thousands | ESR (adm) | PBF (adm) | LFT (adm) | Total bilirubin (adm) | Direct bilirubin (adm) | SGOT (adm) | SGPT (adm) | ALP (adm) | Total protein (adm) | Serum Albumin (adm) | INR/PT (adm) | Blood urea (adm) | Serum Creatinine (adm) | Na (Adm) | K (Adm) | Cl (adm) | Ca (Adm) | Mg (Adm) | Phos (adm) | Uric acid (adm) | CRP (adm) | BNP (adm) | Urine R/E (adm)- RBC | Urine R/E (adm)-puss cell | Urine R/E (adm)- proteinuria | AntiHIV(Rapid/ELISA) (adm) | AntiHCV (Rapid/ELISA) (adm) | HbsAg (Rapid/ELISA) (adm) | Mantoux test - | Connective tissue profile ANA /RF | d dimer | HBA1C | CM > 0.7 | fungitell >80 pg/ml | PCT | TSH | raised tumour marker- | Hb (dis) | MCV (dis) | TLC (dis) | DLC (dis)N | DLC (dis) L | DLC (dis)E | Platelet (dis) | ESR (dis) |
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| S. No. | Name | MRD No. | Total bilirubin (d/s) | Direct bilirubin (d/s) | SGOT (d/s) | SGPT (d/s) | ALP (d/s) | Total protein (d/s) | Serum Albumin (d/s) | INR/PT (d/s) | Blood urea (d/s) | Serum Creatinine (d/s) | Na (D/s) | K (D/s) | Cl (d/s) | Ca (D/s) | Mg (D/s) | Phos (d/s) | Blood C/S Bacterial no | Blood C/S Bacterial - | Blood C/S Fungal- | Blood C/S Fungal- organism | Urine C/S Bacterial | Urine C/S Bacterial-organism | Urine C/S Fungal | Urine C/S- organism | Exu-1, Transu-0 | Gross appearance: | pH | Fluid Albumin | Fluid protein | Serum protein | Ratio Pf protein/ serum. protein | Fluid LDH | Serum LDH | Ratio | Fluid glucose mg/dl | pf TLC | pf DLC- MNC | pf DLC - N | Ratio - L/N | DLC RBC | Gram staining: | G/S- GNB | G/S-GNCB | G/S-GPC | G/S- Puss cell | Acid fast staining: | CBNAAT: | LPA | ADA | ANA | RF | Flow cytometry for diagnosis of lymphoma | M cells - 1 st sample- | M cell 2 nd sample- | M cell 3 rd sample- | Pleural fluid c/s-growth | Pleural fluid C/S - Organism- staph | Pf - other | PLEUAL BIOPSY AFB/TB PCR | Sputum C/S - organism | GPC IN PAIR | GPC IN CHAINS | GNB | GNCB | ZN stain | KOH | KOH- fungal stain organism | Nocardia | Routine C/S : growth | culture Organism- growth | Fungal C/S : growth | CBNAAT | LPA | LJ Medium | LN -RNAC ZN staining/CBNAAT/giant cell granuloma |
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S. No.	Name	MRD No.	LN-Biopsy	LUNG BIOPSY -	Others	Widal:	Dengue serology:	Dengue NS 1 antigen :	Malaria antigen:	Leptospira serology :	Scrub typhus:	Brucella:	Anti HAV:	Anti HEV	pleural effusion	CXR-Blunting of post CP angle	CXR- Blunting of lat CP angle	CXR-Meniscus Sign	CXR-Fluid in Fissures	CXR-Loss of diaphragmatic/ Cardiac outline opacification of hemithorax	CXR-mediastinal shift to opposite side	CXR- conso	CXR- cav	CXR-AFL	usg chest-eff	usg chest- side of pleural effusion	usg chest-Grade of pleural effusion-	usg chest- septated:	usg chest- pl. thickening	usg chest- cons	usg abdomen- hepa	usg abdomen-hepa(cm)	usg abdomen- spl	usg abdomen- RPCG	usg abdomen-FF- Free fluid	usg abdomen- other finding	CT chest- PE loculated	CT chest-mass	CT chest-PTE	CT chest-pleural thickening	CT chest-GGO	CT chest-miliary mottling	CT chest-nodules	CT chest-cavitatory lesion	CT chest-AFL	CT chest- fibrosis/ bronchietatic changes	CT chest-mediastinal LAP	CT chest-conso	probable etiology tased on CT chest- other	MRI
28	RKS	727753	-	-	Af analysis - alb-1.9, glu-79, prot- 4.7, cytology TLC/MNC/N/RBC-800/90/10/800 SAAG-0.6 (LOW), lympho pred ADA-137	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	1	-	1	2	-	-	-	-	-	-	0	-	1	0	-	1	-	-
29	SK	868046	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	BK	856726	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	1	1	-	-
31	DRS	353800	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	1	-	2	-	-
32	AS	198044	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	G	726060	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	1	-	-
34	HK	728580	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	L side PE, mild pericardial effusion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	UR	738284	-	-	-	0	0	0	0	0	0	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	SK	758002	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	1	-	1	-	-	bulky head of panc	2	-	-	-	-	-	-	-	-	-	-	-	3	ANP	-
37	RK	757895	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	GS	750145	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	-	-	-	0	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	RP	754860	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	2	1	0	0	0	1	-	1	-	1	-	2	-	-	-	-	-	-	-	-	-	1	-	1	-	-
40	JC	75346	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	1	-	1	-	-	1	-	1	echotexture changes of liver	1	-	-	-	-	-	-	-	-	-	-	1	3	-	-
41	KS	641507	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	PL	760462	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	BA	753015	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	0	0	0	-	-	-	-	-	B/L PN'itis, Polypoidal growth in U.B;	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	P	768122	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	-	-	-	-	-	-	0	0	0	1	2	2	0	0	0	0	-	-	-	-	SLF ~14 wk 1d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	NKT	756542	-	-	CSF- ADA-19.56; Glu 41; protein- 452, CBNAAT - No MTB, C/S - no growth, TLC-25, MNC-10, N-0,RBC-O ?TBM	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	-	1	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	NBS	767026	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	-	-
47	JK	429084	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	1	0	0	1	2	1	1	0	1	1	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	GS	33048	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	-	-
49	HS	770989	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	RK	760341	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	VS	769534	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	RK	764028	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	AR	765950	0	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	1	1	0	1	2	2	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	NK	681728	-	-	Af analysis- G/S- GNB(few) ; C/S- E. coli	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	RC	770249	-	-	-	0	0	ND	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	1	2	1	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	AS	770424	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	0	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	1	wet peritoneal TB with peritoneal adhesions causing distal small gut obstruction, mesentric LAP, right empyema	-
57	MR	770090	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	bulky head of panc, coarse echo texture of liver	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S. No.	Name	MRD No.	Other investigations	RWMA-	global hypokinesia-	EF	LVH	LV diastolic dysfunction	MS/ dilated LA	RV dysfunction	RV dil/ inc PA pressure/ mild TR/PR	pericardial effusion	other echo finding	Outside reports	therapeutic tap	Medical management-	chest tube or pig tail insertion:	Sx intervention - VATS	stk ins:	Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance new clinical symptoms/signs	new symptoms	TLC	DLC	Hb	platelet	B(T)	B(D)	SGOT	SGPT	ALP	T.prot	albumin	Urea	Creat	Na	K
28	RKS	727753	-	0	0	60	-	0	-	0	-	-	-	-	0	2	0	-	0	0	1	0	-	4.6	10.4/31/5/0.2	10.4	301	-	-	32	16	1.68	4.5	-	-	-	-	-
29	SK	868046	-	-	-	-	-	-	-	-	-	-	-	-	1	5	0	-	0	1	0	0	inc in SOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	BK	856726	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	DRS	353800	-	-	-	-	-	-	-	-	-	-	-	-	0	5	0	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	AS	198044	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	25	42	-	-	-	-	-	-	-
33	G	726060	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	-	-	51	45	-	-	-	-	-	-	-
34	HK	728580	-	-	-	-	-	-	-	-	-	-	-	-	0	5	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	UR	738284	-	-	-	-	-	-	-	-	-	-	-	-	0	6	0	-	0	0	1	0	-	13.8	74/11/9.2/5.5	-	-	-	-	-	-	-	-	-	4.3	-	-
36	SK	758002	-	0	1	35	-	-	-	-	-	-	-	-	0	1	0	-	0	0	1	0	-	9	46/47/5/5	10.5	231	-	-	19	18	57	7.3	3.7	-	-	-	-
37	RK	757895	-	-	-	-	-	-	-	-	-	-	-	ct chest - centimetric mediastinal LAP, mod R side PE , patchy multifocal GGO in both lung, more on left side- Infectious etiology	0	2	1	-	1	1	1	0	-	4.7	57/32/1.7/.5	10.6	433	0.58	0.47	91	35	-	6.6	2.92	-	-	-	-
38	GS	750145	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	0	0	1	0	Tube removed on follow up but following which PnTx was formed; reiserted of ICD	8	83/10/4.6	11.8	400	4	3.5	2851	912	-	7.4	2.8	-	-	-	-
39	RP	754860	-	0	0	60	-	0	-	0	-	-	-	-	0	2	0	-	0	0	0	1	SOB	-	-	-	-	-	-	26	29	-	-	-	-	-	-	-
40	JC	75346	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	0	1	0	-	9	67/15	9.1	115	-	-	81	52	-	-	-	-	-	-	-
41	KS	641507	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	PL	760462	-	-	-	-	-	-	-	-	-	-	-	CXR- L side mild PE	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	14	25	-	-	-	-	-	-	-
43	BA	753015	-	-	-	-	-	-	-	-	-	-	-	usg abd- 1.3x1.3 cm UB mass left lat wall, prostate 36cc; r side PE- exudative ADA 51 Neutrophil pred on ATT x 1 month	0	2	0	-	0	0	1	0	-	10.3	76/15/6.3	10.5	450	-	-	18	16	-	-	-	81	3.19	-	-
44	P	768122	-	0	0	60	0	0	0	0	0	0	-	USG Abd: Mild R PE; Seg Atelectasis of right lower lobe	0	2	0	-	0	0	1	1	nausea & vomiting	-	-	-	-	-	-	47	34	-	-	-	-	-	-	-
45	NKT	756542	-	-	-	-	-	-	-	-	-	-	-	-	0	1,2	0	-	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	NBS	767026	-	-	-	-	-	-	-	-	-	-	-	-	0	2	1	-	0	0	1	0	-	-	-	-	-	-	-	19	21	-	-	-	-	-	-	-
47	JK	429084	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	1	0	0	-	7.2	85/25	11.7	187	-	-	-	-	-	-	-	-	-	-	-
48	GS	33048	-	-	-	-	-	-	-	-	-	-	-	-	0	1,2	0	-	0	0	1	0	-	-	-	-	-	-	-	27	11	-	5.2	2.9	-	-	-	-
49	HS	770989	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	0	0	1	0	-	9.1	48/38/0.4	13	321	-	-	-	-	-	-	-	-	-	-	-
50	RK	760341	-	0	0	60	1	1	-	0	-	1	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	45	25	-	-	-	-	-	-	-
51	VS	769534	-	0	0	60	-	0	-	0	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	-	1.1	0.3	95	72	-	6.7	3.2	-	-	-	-
52	RK	764028	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	0	-	-	-	-	-	16	18	-	-	-	-	-	-	-
53	AR	765950	-	0	0	60	1	1	-	0	-	-	-	-	0	2	1	1	0	0	1	0	-	-	-	-	-	-	-	24	29	-	-	-	-	-	-	-
54	NK	681728	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	0	0	1	0	-	-	-	-	-	-	-	21	15	-	-	-	-	-	-	-
55	RC	770249	-	0	0	60	-	0	-	0	-	-	-	-	0	1	1	-	1	0	1	0	-	21	83/21/0.9	10.3	156	-	-	-	-	-	-	-	-	1.4	-	-
56	AS	770424	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	1.2	0.5	26	18	-	5.3	3.2	-	-	-	-
57	MR	770090	-	-	-	-	-	-	-	-	-	-	-	-	0	5	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S. No.	Name	MRD No.	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance of new clinical symptoms/signs	new clinical symptoms/signs	Investigations	TLC	Hb	platelet	creatinine	B(T)	SGOT	SGPT	ALP	T.prot	albumin	creatinine	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs	Appearancef new clinical symptoms/signs	new symptoms	others
28	RKS	727753	-	-	0	1	1	inc in weight 65 to 68 kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
29	SK	868046	CXR - inc in pleural effusion , 1 time tap was done outside	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	BK	856726	pleural thickening	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
31	DRS	353800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	AS	198044	N	-	0	1	0	-	-	-	-	-	-	-	42	13	-	-	-	-	-	-	0	1	0	-	Completed and stopped ATT
33	G	726060	Mild R PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	HK	728580	Left CP angle clear, ct with thyroid replacement	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
35	UR	738284	-	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
36	SK	758002	N	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
37	RK	757895	readmisiom on 12/7/19 ;usg chest - mild loculated pleural effusion on right side with echogenic foci ? Air foci; - usg guided cathetar drainage; pf analysis - TLC(MNC/N/RBC)- 10000(15/85/20000) biochem- alb-0.52 protein-1.3 glu-17 ; EMPYEMA. LFT- B(T)-.58 B(D)-.47 OT/PT-91/35 alb-2.92 prot-6.6 ALP-126 HEMOGRAM - Hb-10.6, TLC-4.7 (57/32/1.7/.5), PLT-433; usg guided cathetar darinage again	reinsertion of chest tube and iv antibiotic was given	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	CXR- no e/o PE, lung expanded, mild pleural thickening present on right side	-	0	1	0	-	-
38	GS	750145	LFT: B(T) 4,B(D) 3.5; OT/PT 2851/912; total prt 7.4; albu 2.8; CBC: TLC 8 (83/10/4.6); HB 11.8; Plt 400; Chest X Ray: No E/O PE ?ATT induced hepatitis- on modified ATT	Mod ATT	0	1	0	-	-	-	-	-	-	-	951	231	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
39	RP	754860	mod PE	repeat therapeutic tap done	0	1	0	-	-	-	-	-	-	-	17	23	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
40	JC	75346	right side mild CP angle blunting	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	KS	641507	MRI spine- infective spondylodiscitis D9-D12 vertebrae ?Tb ; CXR - L CP angle clear : ATT continued	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1	fever, burning micturition, sepsis	oral antibiotic
42	PL	760462	-	-	0	1	0	-	-	-	-	-	-	-	24	32	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
43	BA	753015	readmission with same reaon. Histopath post TURB s/o CaUB, 2nd dose of CYP not given i/v/o sepsis TLC- 10.3(76/15/6.3) urea-81 creat3.19 crp-147 OT/PT-18/16 CXR- L side mild PE persistent	CRP-147	0	1	1	hematuria	relook cystoscopy,CXR - L cp angle blunt	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
44	P	768122	-	-	0	1	0	-	-	-	-	-	-	-	12	29	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
45	NKT	756542	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-
46	NBS	767026	R CP Angle clearing & Lung Exp	-	0	1	0	-	-	-	-	-	-	-	18	15	-	-	-	-	-	-	0	1	0	-	-
47	JK	429084	persistence of PE, pig tail conti, iv antibiotic conti	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	pig tail removed outside	0	1	0	0	-
48	GS	33048	-	ct with ATT	0	1	0	-	-	-	-	-	-	0.9	37	23	-	-	-	-	-	-	0	1	0	-	-
49	HS	770989	CXR-minimal hazziness at L CP angle	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	RK	760341	No e/o pleural effusion	-	0	1	0	-	-	-	-	-	-	-	42	12	-	-	-	-	-	-	0	1	0	-	-
51	VS	769534	udiliv added: ct with ATT	-	0	1	0	-	-	-	-	-	-	-	56	35	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
52	RK	764028	-	-	0	1	0	-	-	-	-	-	-	-	38	19	-	-	-	-	-	-	0	1	0	-	completed and stopped ATT
53	AR	765950	-	-	0	1	0	-	-	-	-	-	-	-	36	29	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
54	NK	681728	N	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	RC	770249	-	IV antibiotic were given 10 days at outside hospital	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	AS	770424	N	-	0	1	0	-	-	-	-	-	-	-	34	16	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
57	MR	770090	N	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-

| S. No. | Name | MRD No. | Urban/ Rural | Age (Yrs) | Adm. No. | Ward/Unit | Ward/ ICU | Gender : F/M | DOA | DOD | Outcome: DAMA / Death/ Disch | Pleural effusion Loculated | side of effusion | Grade | nature of pleural effusion | Etiology | Pneumonitis | Pneumonia causing agent | Malignancy primary | Pancreatitis | Mediastinal LAP | Cavitatory Lung Lesion | Polyserositis | Post Abdominal Surgery | Trauma | AFI | Tropical Fever | UTI | PUO | Sepsis | Shock | MOF | Fluid Overload | Hepatitis | Myelitis | Infective Endocarditis | PTE | LOS -Ward (day) | LOS- ICU(day) | LOS (days) | Duration of symptoms (in Days) | Dyspnoe | Dyspnoea – increase on exertion & decreases at rest | Dyspnoea Severity MMRC grade | Cough | Sputum vol: tsp/day | Sputum colour | Sputum consistency | Haemoptysis – Volume | Chest pain | Chest pain site | Chest pain – Radiation | Chest pain Character – Sharp | Chest pain- Inc with Inspiration/ Dec with Expiration | Onset | Progressive Course | Severity | pain inc with inspiration & cough | pain dec with expiration | Previous episodes | Fever | Continuous /Intermittent | Chills | Evening rise | Night Sweats | Anorexia | Weight loss | Palpitations | Breathelessness (NYHA Grade) | Fatiguability or generalised weakness | Chest Pain | Others | Nausea | Vomiting | Pain abdomen | Site of pain | Duration (Days) | Intensity | Radiation of pain towards back | Aggravated by movement or deep inspiration | Relieving factor | Abdominal distension | loose stools | constipation | Jaundice | Others |
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| S. No. | Name | MRD No. | Burning micturition | Increased frequency of micturition | Decreased urine output | Others | Headache | Altered sensorium | LBA | Seizures | quadriparesis | Hemiparesis | Other(s) | TB | DM | HTN | VHD | CAD | CKD | CLD | Arthritis | CVA | COPD | TB- pulm/abdl/disseminated/miliary/ tbm/Extrapulm other-6 | ILD | Hypothyroidism | malignancy | malignancy | OSA | BA | Pregnancy | coeliac ds | seizure | PLHIV | IBD | Conjulmonale | Veg/Non-veg | Smoker | Alcoholic | Duration (in Years) | Quantity (ml/day) | Substance abuse | Substance Abused | Menstrual history (female patients) | Temporal ass with respiratory symptoms | Sensorium | Icterus | Cyanosis | Pallor | Clubbing | Edema | Skin: Rash | LAP | LAP -Region | Trachea | JVP | Temperature (in F) | SBP (mm of Hg) | DBP (mm of Hg) | Pulse (in BPM) | RR (in per min) | Nutritional assessment - BW (in Kg) | Height (Ft) | Height (Inches) | BMI (in Kg/m2) | Respiratory system examination- Inspection - decreased in chest rise | side of dec chest rise | decreased TVF | side of decreased TVF | decreased breath sounds | side of absent breath sound | site of dec breath sound - | stony dull on percussion | side on dullness | Crepitation | laterality of crepitation | Site of Crept | type of bronchial breath (BB) sound | side of BB sound | site of bronchial breath sound - | Abdomen Tenderness | Site- | Bowl Sounds | H'megaly | spl | shifting dullness | any other mass palpable | site of mass | Plantar |
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| S. No. | Name | MRD No. | power UL | power LL | DTR | CVS S1,S2 | Added Sound S3,S4 | ESM, PSM, MDM, EDM | Site of Murmur | GCS | Hb (adm) g/dl | MCV (adm) | TLC (adm) | DLC (adm) P (%) | DLC (adm) L (%) | DLC (adm) E (%) | Platelet (adm) in thousands | ESR (adm) | PBF (adm) | LFT (adm) | Total bilirubin (adm) | Direct bilirubin (adm) | SGOT (adm) | SGPT (adm) | ALP (adm) | Total protein (adm) | Serum Albumin (adm) | INR/PT (adm) | Blood urea (adm) | Serum Creatinine (adm) | Na (Adm) | K (Adm) | Cl (adm) | Ca (Adm) | Mg (Adm) | Phos (adm) | Uric acid (adm) | CRP (adm) | BNP (adm) | Urine R/E (adm)- RBC | Urine R/E (adm)-puss cell | Urine R/E (adm)- proteinuria | AntiHIV(Rapid/ELISA) (adm) | AntiHCV (Rapid/ELISA) (adm) | HbsAg (Rapid/ELISA) (adm) | Mantoux test - | Connective tissue profile ANA /RF | d dimer | HBA1C | CM > 0.7 | fungitell >80 pg/ml | PCT | TSH | raised tumour markes- | Hb (dis) | MCV (dis) | TLC (dis) | DLC (dis)N | DLC (dis)L | DLC (dis)E | Platelet (dis) | ESR (dis) |
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| S. No. | Name | MRD No. | Total bilirubin (d/s) | Direct bilirubin (d/s) | SGOT (d/s) | SGPT (d/s) | ALP (d/s) | Total protein (d/s) | Serum Albumin (d/s) | INR/PT (d/s) | Blood urea (d/s) | Serum Creatinine (d/s) | Na (D/s) | K (D/s) | Cl (d/s) | Ca (D/s) | Mg (D/s) | Phos (d/s) | Blood C/S Bacterial no | Blood C/S Bacterial - | Blood C/S Fungal- | Blood C/S Fungal- organism | Urine C/S Bacterial | Urine C/S Bacterial-organism | Urine C/S Fungal | Urine C/S- organism | Exu-1, Transu-0 | Gross appearance: | pH | Fluid Albumin | Fluid protein | Serum protein | Ratio Pf protein/ serum. protein | Fluid LDH | Serum LDH | Ratio | Fluid glucose mg/dl | pfTLC | pf DLC- MNC | pf DLC - N | Ratio - L/N | DLC RBC | Gram staining: | G/S- GNB | G/S- GNCB | G/S-GPC | G/S- Puss cell | Acid fast staining: | CBNAAT: | LPA | ADA | ANA | RF | Flow cytometry for diagnosis of lymphoma | M cells - 1 st sample- | M cell 2 nd sample- | M cell 3 rd sample- | Pleural fluid c/s-growth | Pleural fluid C/S - Organism- staph PF - other | PLEUAL BIOPSY AFB/TB PCR | Sputum C/S - organism | GPC IN PAIR | GPC IN CHAINS | GNB | GNCB | ZN stain | KOH | KOH- fungal stain organism | Nocardia | Routine C/S : growth | culture Organism- growth | Fungal C/S : growth | CBNAAT | LPA | LJ Medium | LN -RNACZN staining/CBNAAT/giant cell granuloma |
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S. No.	Name	MRD No.	LN-Biopsy	LUNG BIOPSY -	Others	Widal:	Dengue serology:	Dengue NS 1 antigen :	Malaria antigen:	Leptospira serology :	Scrub typhus :	Brucella:	Anti HAV:	Anti HEV	pleural effusion	CXR-Blunting of post CP angle	CXR- Blunting of lat CP angle	CXR-Meniscus Sign	CXR-Fluid in Fissures	CXR-Loss of diaphragmatic/ Cardiac outline opacification of hemithorax	CXR-mediastinal shift to opposite side	CXR- conso	CXR- cav	CXR- AFL	usg chest- eff	usg chest- side of pleural effusion	usg chest-Grade of pleural effusion-	usg chest- septated:	usg chest - pl. thickening	usg chest- cons	usg abdomen- hepa	usg abdomen-hepa(cm)	usg abdomen- spl	usg abdomen- RPCG	usg abdomen-FF- Free fluid	usg abdomen- other finding	CT chest- PE loculated	CT chest-mass	CT chest-PTE	CT chest-pleural thickening	CT chest-GGO	CT chest-miliary mottling	CT chest-nodules	CT chest-cavitatory lesion	CT chest-AFL	CT chest- fibrosis/ bronchietatic changes	CT chest-mediastinal LAP	CT chest-conso	probable etiology based on CT chest- other	MRI
58	RK	738729	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	1	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	1	3	-	-
59	H	329535	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	DS	744082	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	AK	742811	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	1	0	0	1	2	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	U	771941	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	bulky head of panc	-	-	-	-	-	-	-	-	-	-	-
63	AK	804695	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	KS	413725	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	SS	779344	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	2	1	-	-	-	-	-	-	-	-	1	-	2	-	-
66	KK	779767	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	SL	779443	-	-	-	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	milliary mottling in spl- granulomatous; suspected thickening of terminal ileus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	TS	779573	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	1	2	0	0	0	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	1	-	-
69	Y	775804	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	S	635396	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71	SK	781632	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	2	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	RK	780671	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	SK	683759	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	L	810425	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	1	1	-	-
75	D	332347	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	0	1	1	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	JS	823717	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	N	821967	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	0	1	2	1	0	0	0	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	1	3	-	-
78	KC	815663	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
79	SP	632045	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	1	1	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	SK	824386	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	NJ	820808	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	NS	802740	cervical LN biopsy- Reactive hyperplasia	-	-	0	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	1	0	0	1	2	1	0	0	1	0	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	MK	841176	-	-	-	0	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	GS	835513	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-	-
85	JK	633994	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	SK	792137	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	1	1	1	0	0	0	1	2	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	AS	828801	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	0	0	0	0	0	1	2	3	0	0	0	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
88	AK	815649	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	2	1	0	0	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
89	R	828098	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	VS	828054	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	1	0	1	0	0	0	0	1	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S. No.	Name	MRD No.	Other investigations	RWMA-	global hypokinesia-	EF	LVH	LV diastolic dysfunction	MS/ dilated LA	RV dysfunction	RV dil/ inc PA pressure/ mild TR/PR	pericardial effusion	other echo finding	Outside reports	therapeutic tap	Medical management-	chest tube or pig tail insertion:	Sx intervention - VATS	stk ins:	Constitutional features :	Improvement in previous clinical symptoms and signs : :	Appearance new clinical symptoms/signs new symptoms	TLC	DLC	Hb	platelet	B(T)	B(D)	SGOT	SGPT	ALP	T.prot	albumin	Urea	Creat	Na	K
58	RK	738729	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	H	329535	-	-	-	-	-	-	-	-	-	-	-	-	1	5	1	-	0	1	0	0	chest pain & SOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	DS	744082	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	0	0	1	0	-	-	-	-	-	-	87	134	-	-	-	-	-	-	-
61	AK	742811	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	U	771941	-	-	-	-	-	-	-	-	-	-	-	-	0	5	0	-	0	1	1	1	Abdominal Distension	-	-	-	-	0.72	0.1	46	78	131	5.5	2.7	-	-	-	-
63	AK	804695	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	2	1.5	15	21	97	5.6	3.5	-	-	-	-
64	KS	413725	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	1	0	1	Inc in SOB	15.5	81/3	7.7	319	-	-	17	5	-	-	-	-	-	-	-
65	SS	779344	-	0	1	36	-	0	-	0	-	-	-	outside CT chest- mass/ consolidationin LLL, adv biopsy	1	3	1	-	0	1	0	0	waxing & wanning SOB	-	-	-	-	-	-	-	-	-	-	2.6	-	-	-	-
66	KK	779767	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	8.6	60/22/3.7	10.9	414	0.6	0.2	12	9	108	5.3	2.7	86	1.6	130	5.3
67	SL	779443	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	1	Constipation	-	-	-	-	-	-	57	19	-	-	-	-	-	-	-
68	TS	779573	-	-	-	-	-	-	-	-	-	-	-	-	0	1,2	1	-	0	0	1	0	-	11.6	60/20	13	389	0.39	0.09	25	45	-	7	3.9	28	0.96	137	3.9
69	Y	775804	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	1	0	1	reoccurence of fever	15	84/24	9.9	178	-	-	-	-	-	-	-	-	-	-	-
70	S	635396	-	-	-	-	-	-	-	-	-	-	-	Pf alb-0.6, pro-1.2, glu-199, MNC-90, N-10, ADA14.7	0	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71	SK	781632	-	0	0	60	0	0	0	0	0	0	-	started on ATT from outside from 2/8/2019	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	RK	780671	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	34	48	-	-	-	-	-	-	-
73	SK	683759	-	-	-	-	-	-	-	-	-	-	-	-	1	6	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	213	5.6	-	-
74	L	810425	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	15	18	-	-	-	-	-	-	-
75	D	332347	-	0	0	60	-	0	-	0	-	-	-	-	0	1	1	-	0	0	1	0	-	4.9	73/21	11.6	254	-	-	-	-	-	-	-	-	-	-	-
76	JS	823717	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	N	821967	-	0	0	60	0	0	-	0	-	-	-	-	0	1	0	-	0	0	1	0	-	10	79/21/03	9.7	187	-	-	75	23	-	-	-	-	-	-	-
78	KC	815663	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	23	43	-	-	-	-	-	-	-
79	SP	632045	-	-	-	-	-	-	-	-	-	-	-	-	1	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	SK	824386	-	0	0	60	-	0	-	0	-	-	-	-	0	5	0	-	0	1	0	1	pedal edema	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	NJ	820808	-	-	-	-	-	-	-	-	-	-	-	-	0	2	1	-	1	0	1	0	-	7.2	52/26	8.9	261	-	-	37	66	-	-	-	-	-	-	-
82	NS	802740	-	0	0	60	-	0	-	0	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	18	35	-	-	-	-	-	-	-
83	MK	841176	-	-	-	-	-	-	-	-	-	-	-	-	0	2	1	-	0	1	0	1	fever	23	78/19/2.5	9.5	236	0.45	0.09	18	26	79	6.8	3.6	-	1.5	-	-
84	GS	835513	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	-	-	-	29	27	-	-	-	-	-	-	-
85	JK	633994	-	-	-	-	-	-	-	-	-	-	-	-	0	6	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	2.7	-	140	3.2
86	SK	792137	-	-	-	-	-	-	-	-	-	-	-	-	1	5	0	-	0	1	0	1	Abdominal Distension	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	AS	828801	-	0	1	22	-	0	-	0	-	-	-	Pf analysis-MNC/P- 60/40, TLC 1200, LDH ratio-0.5, protein ratio-0.6, ADA-38, started onn ATT from outside	0	6	0	-	0	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	132	3.9
88	AK	815649	fibroscan- N, colonoscopy - edematous colonic mucosa	0	0	60	1	-	-	-	-	1	-	-	0	1	0	-	0	0	1	0	-	8.7	82/14	8.2	142	-	-	-	-	-	-	-	-	-	-	-
89	R	828098	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	VS	828054	-	0	0	60	-	-	-	-	-	-	-	-	0	2	1	-	0	0	1	0	-	-	-	-	-	1.9	-	136	155	-	-	-	-	-	-	-

S. No.	Name	MRD No.	CXR- persistence of pleural effusion. OTHER		Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance of new clinical symptoms/signs	new clinical symptoms/signs	Investigations	TLC	Hb	platelet	creatinine	B(T)	SGOT	SGPT	ALP	T.prot	albumin	creatinine	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs	Appearancef new clinical symptoms/signs	new symptoms	others
58	RK	738729	blunting of L CP angle cardiophrenic present but dec in fluid levels	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	0	1	0	-	-
59	H	329535	USG Chest: R Side significant PE	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	DS	744082	N	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	CXR- mild L CP angle blunt	-	0	1	0	-	-
61	AK	742811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	U	771941	usg f/u- AP, small loculated PPC with GB sludge; CT abd- AP intrapancreatic collection , spl, infla thickening involving stomach, colon; moderate ascitis ; ca-8.9 mg-1.91 LFT- B(T/D)-0.72/0.1 OT/PT- 46/78 ALP-121 alb- 2.7 prot-5.5; oral antibiotic continued and pig tail in PPC	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	No e/o PE	-	0	1	0	-	-
63	AK	804695	CXR- no e/o PE	-	0	1	0	-	-	-	-	-	-	-	12	47	-	-	-	-	-	-	0	1	0	-	-
64	KS	413725	USG Chest: Mild mod free fluid noted along L posterolateral chest wall with underlying collapse/consoldn, CXR: inc in PE, Repeat Pleural TAP, MNC 2, N 98%, TLC 12000, Biochemistry Alb-1.75, Glu 6, Prot 4.4, pH 7.0 ; Reeadmitted after 1 week,drain inserted and IV Antibiotics given	-	0	1	1	chest pain R side	-	-	-	-	-	-	-	-	-	-	-	-	right side pleural thickening	-	0	1	0	0	completed and stopped ATT
65	SS	779344	CXR- mod-severe left PE	Calcium- 9.1, pleurodesis done outside, chest tube removed	1	0	1	seizure episode	MRI brain- metastasis in right parietal lobe	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	-
66	KK	779767	CXR: No evidence of PE	-	0	1	0	-	HbA1C 8.1, ESR 49	5.8	11	244	-	-	-	-	-	-	-	N	-	0	1	0	-	Pt completed & stopped ATT
67	SL	779443	N	`	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
68	TS	779573	L cardiophrenic & costophrenic angle is clear; Hmg: TLC 11.5, DLC 66/20/9; Hb 13, MCV 82, Platelet 389, Urea 28, Cret 0.5; Na/k 137/3.89, LFT B(T/D) 0.39/0.09, SGOT/PT 26/34, Alb 3.9, tot protein 7,	-	0	1	0	-	-	-	-	-	-	-	37	29	-	-	-	-	-	-	0	1	0	-	-
69	Y	775804	Blunting of L CP Angle	reinsertion of pig tail	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
70	S	635396	therapuetic aspiration done after 1 M	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
71	SK	781632	SGOT/PT- 43/23	-	0	1	0	-	SGOT/PT- 27/29	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
72	RK	780671	only blunting of R side PC angle	-	0	1	0	-	-	-	-	-	-	-	26	47	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
73	SK	683759	usg doppler- No DVt, CXR- right side , mild PE	-	0	1	1	apetite dec	-	6.6	8.1	140	4.5	-	-	-	-	-	-	4.5	N	-	0	1	0	-	-
74	L	810425	N	-	0	1	0	-	-	-	-	-	-	-	27	29	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
75	D	332347	-	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	JS	823717	CXR- mild left CP angle bluntung OT/PT- 43/21	-	0	1	0	-	CXR - clear OT/PT-43/22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
77	N	821967	-	ESR-64, urine R/E- ca oxalate crystal	0	1	0	-	ESR-17	7	13.3	419	-	-	73	75	-	-	-	-	-	-	0	1	0	0	-
78	KC	815663	-	-	0	1	0	-	-	-	-	-	-	-	46	52	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
79	SP	632045	L side Mod PE	repeat therapeutic tap	0	1	0	-	pt started on medicine causing inc in urine output? diuretics, Na/K- 134/3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
80	SK	824386	RA factor +, anti CCP +, limited cuts CT- moderate left PE , diffuse pericardial thickening, ANA awaited	-	0	1	0	-	pt was started on desi medication (?steroid) as per attendant	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
81	NJ	820808	ESR-67	-	0	1	0	-	-	-	-	-	-	-	23	41	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
82	NS	802740	R side CP angle blunting	-	0	1	0	-	-	-	-	-	-	-	25	31	-	-	-	-	R side CP angle blunting	USG chest- mild right pleural thickening	0	1	0	0	completed and stopped ATT
83	MK	841176	CXR: L side PE with internal echoes	Pf analysis- TLC/MNC/P- 21300/40/60 LDH ratio-2.3 protein ratio- o.7 G/S- GNB C/s- klebsiella; readmitted; pig tail inserted; IV antibiotic started along with ATT	0	1	0	-	-	-	-	-	-	-	35	17	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
84	GS	835513	Mild L side CP Blunting	-	0	1	0	-	-	-	-	-	-	-	43	56	-	-	-	-	-	-	0	1	0	0	completed and stopped ATT
85	JK	633994	L CP angle blunting	-	0	1	1	Pedal Edema	2D Echo: LV Dysfun, EF 22%	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
86	SK	792137	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	AS	828801	Resolution of PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
88	AK	815649	-	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
89	R	828098	Mild L CP Angle blunting	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	VS	828054	R side pleural thickening seen	-	0	1	0	-	-	-	-	-	-	1.2	97	122	-	-	-	-	-	-	0	1	0	0	-

| S. No. | Name | MRD No. | Urban/ Rural | Age (Yrs) | Adm. No. | Ward/Unit | Ward/ ICU | Gender : F/M | DOA | DOD | Outcome: DAMA / Death/ Disch | Pleural effusion Loculated | side of effusion | Grade | nature of pleural effusion | Etiology | Pneumonitis | Pneumonia causing agent | Malignancy primary | Pancreatitis | Mediastinal LAP | Cavitatory Lung Lesion | Polyserositis | Post Abdominal Surgery | Trauma | AFI | Tropical Fever | UTI | PUO | Sepsis | Shock | MOF | Fluid Overload | Hepatitis | Myelitis | Infective Endocarditis | PTE | LOS -Ward (day) | LOS- ICU(day) | LOS (days) | Duration of symptoms (in Days) | Dyspnoe | Dyspnoea – increase on exertion & decreases at rest | Dyspnoea Severity MMRC grade | Cough | Sputum vol: tsp/day | Sputum colour | Sputum consistency | Haemoptysis – Volume | Chest pain | Chest pain site | Chest pain – Radiation | Chest pain Character – Sharp | Chest pain- Inc with inspiration/ Dec with Expiration | Onset | Progressive Course | Severity | pain inc with inspiration & cough | pain dec with expiration | Previous episodes | Fever | Continuous /Intermittent | Chills | Evening rise | Night Sweats | Anorexia | Weight loss | Palpitations | Breathelessness (NYHA Grade) | Fatiguability or generalised weakness | Chest Pain | Others | Nausea | Vomiting | Pain abdomen | Site of pain | Duration (Days) | Intensity | Radiation of pain towards back | Aggravated by movement or deep inspiration | Relieving factor | Abdominal distension | loose stools | constipation | Jaundice | Others |
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| S. No. | Name | MRD No. | Burning micturition | Increased frequency of micturition | Decreased urine output | Others | Headache | Altered sensorium | LBA | Seizures | quadriparesis | Hemiparesis | Other(s) | TB | DM | HTN | VHD | CAD | CKD | CLD | Arthritis | CVA | COPD | TB- pulm/abdl/disseminated/miliary/ tbm/Extrapulm other-6 | ILD | Hypothyroidism | malignancy | malignancy | malignancy | OSA | BA | Pregnancy | coeliac ds | seizure | PLHIV | IBD | Conjutmonale | Veg/Non-veg | Smoker | Alcoholic | Duration (in Years) | Quantity (ml/day) | Substance abuse | Substance Abused | Menstrual history (female patients) | Temporal ass with respiratory symptoms | Sensorium | Icterus | Cyanosis | Pallor | Clubbing | Edema | Skin: Rash | LAP | LAP -Region | Trachea | JVP | Temperature (in F) | SBP (mm of Hg) | DBP (mm of Hg) | Pulse (in BPM) | RR (in per min) | Nutritional assessment - BW (in Kg) | Height (Ft) | Height (Inches) | BMI (in Kg/m2) | Respiratory system examination-Inspection - decreased in chest rise | side of dec chest rise | decreased TVF | side of decreased TVF | decreased breath sounds | side of absent breath sound | site of dec breath sound - | stony dull on percussion | side on dullness | Crepitation | laterality of crepitation | Site of Crept | type of bronchial breath (BB) sound | side of BB sound | site of bronchial breath sound - | Abdomen Tenderness | Site- | Bowl Sounds | H'megaly | spl | shifting dulness | any other mass palpable | site of mass | Plantar |
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| S. No. | Name | MRD No. | power UL | power LL | DTR | CVS S1,S2 | Added Sound S3,S4 | ESM, PSM, MDM, EDM | Site of Murmur | GCS | Hb (adm) g/dl | MCV (adm) | TLC (adm) | DLC (adm) P (%) | DLC (adm) L (%) | DLC (adm) E (%) | Platelet (adm) in thousands | ESR (adm) | PBF (adm) | LFT (adm) | Total bilirubin (adm) | Direct bilirubin (adm) | SGOT (adm) | SGPT (adm) | ALP (adm) | Total protein (adm) | Serum Albumin (adm) | INR/PT (adm) | Blood urea (adm) | Serum Creatinine (adm) | Na (Adm) | K (Adm) | Cl (adm) | Ca (Adm) | Mg (Adm) | Phos (adm) | Uric acid (adm) | CRP (adm) | BNP (adm) | Urine R/E (adm)- RBC | Urine R/E (adm)-puss cell | Urine R/E (adm)- proteinuria | AntiHIV(Rapid/ELISA) (adm) | AntiHCV (Rapid/ELISA) (adm) | HbsAg (Rapid/ELISA) (adm) | Mantoux test - | Connective tissue profile ANA /RF | d dimer | HBA1C | CM > 0.7 | fungitell >80 pg/ml | PCT | TSH | raised tumour marker- | Hb (dis) | MCV (dis) | TLC (dis) | DLC (dis)N | DLC (dis)L | DLC (dis)E | Platelet (dis) | ESR (dis) |
|---|---|---

| S. No. | Name | MRD No. | Total bilirubin (dis) | Direct bilirubin (dis) | SGOT (dis) | SGPT (dis) | ALP (dis) | Total protein (dis) | Serum Albumin (dis) | INR/PT (dis) | Blood urea (dis) | Serum Creatinine (dis) | Na (Dis) | K (Dis) | Cl (dis) | Ca (Dis) | Mg (Dis) | Phos (dis) | Blood C/S Bacterial no | Blood C/S Bacterial - | Blood C/S Fungal- | Blood C/S Fungal- organism | Urine C/S Bacterial | Urine C/S Bacterial-organism | Urine C/S Fungal | Urine C/S - organism | Exu-1, Transu-0 | Gross appearance: | pH | Fluid Albumin | Fluid protein | Serum protein | Ratio Pf protein/ serum. protein | Fluid LDH | Serum LDH | Ratio | Fluid glucose mg/dl | pfTLC | pf DLC- MNC | pf DLC - N | Ratio - L/N | DLC RBC | Gram staining: | G/S- GNB | G/S-GNCB | G/S-GPC | G/S- Puss cell | Acid fast staining: | CBNAAT: | LPA | ADA | ANA | RF | Flow cytometry for diagnosis of lymphoma | M cells - 1 st sample- | M cell 2 nd sample- | M cell 3 rd sample- | Pleural fluid c/s-growth | Pleural fluid C/S. - Organism- staph | Pf - other | PLEUAL BIOPSY AFB/TB PCR | Sputum C/S - organism | GPC IN PAIR | GPC IN CHAINS | GNB | GNCB | ZN stain | KOH | KOH- fungal stain organism | Nocardia | Routine C/S : growth | culture Organism- growth | Fungal C/S : growth | CBNAAT | LPA | LJ Medium | LN -FNAC ZN staining/CBNAAT/giant cell granuloma |
|---|---|---

S. No.	Name	MRD No.	LN-Biopsy	LUNG BIOPSY -	Others	Widal:	Dengue serology:	Dengue NS 1 antigen :	Malaria antigen:	Leptospira serology :	Scrub typhus :	Brucella:	Anti HAV:	Anti HEV	pleural effusion	CXR-Blunting of post CP angle	CXR- Blunting of lat CP angle	CXR-Meniscus Sign	CXR-Fluid in Fissures	CXR-Loss of diaphragmatic/ Cardiac outline opacification of hemithorax	CXR-mediastinal shift to opposite side	CXR- conso	CXR- cav	CXR- AFL	usg chest-eff	usg chest- side of pleural effusion	usg chest-Grade of pleural effusion-	usg chest- septated:	usg chest- pl. thickening	usg chest- cons	usg abdomen- hepa	usg abdomen-hepa(cm)	usg abdomen- spl	usg abdomen- RPCG	usg abdomen-FF- Free fluid	usg abdomen- other finding	CT chest- PE loculated	CT chest-mass	CT chest-PTE	CT chest-pleural thickening	CT chest-GGO	CT chest-miliary mottling	CT chest-nodules	CT chest-cavitatory lesion	CT chest-AFL	CT chest- fibrosis/ bronchietatic changes	CT chest-mediastinal LAP	CT chest-conso	probable etiology based on CT chest- other	MRI
91	M	821794	-	-	ascitic tap -L predominant High ADA(224), low SAAG(0.3) ; cytology- TLC/L/N/RBC- 950/90/10/1000; Alb- 2.7, glu - 88mg/dl, prot- 5.5	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92	AS	822198	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S. No.	Name	MRD No.	Other investigations	RWMA-	global hypokinesia-	EF	LVH	LV diastolic dysfunction	MS/ dilated LA	RV dysfunction	RV dil/ inc PA pressure/ mild TR/PR	pericardial effusion	other echo finding	Outside reports	therapeutic tap	Medical management-	chest tube or pig tail insertion:	Sx intervention - VATS	stk ins:	Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance new clinical symptoms/signs	new symptoms	TLC	DLC	Hb	platelet	B(T)	B(D)	SGOT	SGPT	ALP	T.prot	albumin	Urea	Creat	Na	K
91	M	821794	-	0	0	60	-	-	-	-	-	1	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92	AS	822198	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	LS	826347	-	-	-	-	-	-	-	-	-	-	-	-	1	3	0	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
94	MF	52356	-	1	0	35	1	0	-	0	-	-	-	-	0	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95	MS	834781	-	-	-	-	-	-	-	-	-	-	-	-	0	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	AG	833012	-	0	0	60	-	-	-	-	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	0.9	-	21	17	-	-	-	-	-	-	-
97	V	831715	-	-	-	-	-	-	-	-	-	-	-	-	1	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	MD	831643	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	2.3	-	22	21	-	-	-	-	-	-	-
99	GK	785999	-	-	-	-	-	-	-	-	-	-	-	-	1	5	1	-	0	1	0	1	inc SOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	N	829840	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	-	923	511	-	-	-	-	-	-	-
101	SS	815380	-	0	0	60	1	0	-	0	-	-	RVOT vegetation	-	0	1	1	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	HS	870141	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	0.9	-	-	22	-	-	-	-	-	-	-
103	BD	804529	-	0	0	60	1	0	-	-	-	-	-	-	1	5	0	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	PK	169969	Holter- ectopic +, compensatory pause; carotid doppler-60% plaque R carotid bulb,RICA, RECA, 40%plaque in L carotid bulb	0	0	60	1	1	1	-	1	-	-	-	0	1	1	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	JK	870057	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	0	0	1	0	-	12	79/14	9.5	185	-	-	-	-	-	-	-	-	-	-
106	ML	796951	-	-	-	-	-	-	-	-	-	-	-	-	1	5	1	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	RSJ	869745	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	1	-	36	21	-	-	-	-	-	-	-
108	NS	165604	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	15	89/12	9.7	211	1.1	-	-	21	-	-	-	-	-	-
109	MN	873728	B/L LL dopper-no e/o DVT	0	0	60	-	0	-	0	-	-	-	-	1	2	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	LB	872647	-	-	-	-	-	-	-	-	-	-	-	-	0	1,2	0	-	0	0	1	1	chest pain	-	-	-	-	1.09	0.2	24	18	-	5.7	3.2	-	-	-	-
111	SK	603290	-	-	-	-	-	-	-	-	-	-	-	-	0	2	1	-	1	1	0	1	reoccurence of fever, chest pain	18	92/08	9.4	245	1.9	0.9	15	45	145	3.9	2.1	-	-	-	-
112	KS	870111	-	0	0	60	1	1	-	0	-	-	-	-	0	6	0	-	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	MK	864587	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	-	0	0	1	0	-	-	-	-	-	0.9	0.3	53	42	129	6.3	3.4	-	-	-	-
114	NK	874467	-	-	-	-	-	-	-	-	-	-	-	-	1	5	1	-	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115	SR	868585	-	-	-	-	-	-	-	-	-	-	-	-	0	2,4	1	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	PK	863765	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S. No.	Name	MRD No.	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs :	Appearance of new clinical symptoms/signs	new clinical symptoms/signs	Investigations	TLC	Hb	platelet	creatinine	B(T)	SGOT	SGPT	ALP	T.prot	albumin	creatinine	CXR- persistence of pleural effusion	OTHER	Constitutional features :	Improvement in previous clinical symptoms and signs	Appearancef new clinical symptoms/signs	new symptoms	others
91	M	821794	CXR: PE Resolved	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
92	AS	822198	PE Resolved	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	LS	826347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-
94	MF	52356	CXR: PE resolved	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
95	MS	834781	-	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
96	AG	833012	CXR: Mild PE	-	0	1	0	-	-	-	-	-	-	1	24	21	-	-	-	-	R CP Angle Blunting	-	0	1	0	-	-
97	V	831715	CXR- mild R HTx	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	mild R CP angle blunting	-	0	1	0	-	-
98	MD	831643	-	-	0	1	0	-	-	-	-	-	-	-	14	24	-	-	-	-	-	-	0	1	0	-	-
99	GK	785999	-	VATS guided decortication surgery	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	N	829840	R CP Angle Blunt	-	0	1	0	-	-	-	-	-	-	-	321	76	-	-	-	-	-	-	0	1	0	0	-
101	SS	815380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	HS	870141	Mild R PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	R CP Angle Blunting	-	0	1	0	-	Pt completed & stopped ATT
103	BD	804529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	PK	169969	N	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
105	JK	870057	mild R PE	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	-	-
106	ML	796951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	RSJ	869745	-	add isonex	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	0	1	0	-	-
108	NS	165604	Resolution of R LZ cons, only Mild R CP Angle blunting present	-	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	MN	873728	Mild R PE	Pt Stopped ATT	0	1	0	-	CXR: PE Resolution	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	LB	872647	HPnTx	reinsertion of chest tube for 5days, TSH-0.6	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-
111	SK	603290	-	HRCT Chest:loculated pleural Fluid in R Pleural Cavity, Mediastinal LAP Pf G/S- GNB+ ph-6.9 glu-21 LDH ratio-1.3 prot ratio-0.8 ; IV antibiotic & pig tail insertion	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	right sided pleural thickening	-	-	-	-	-	-
112	KS	870111	N	ANA- negative	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	-
113	MK	864587	-	-	0	1	0	-	-	-	-	-	-	-	37	25	-	-	-	-	-	-	0	1	0	-	Pt completed & stopped ATT
114	NK	874467	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115	SR	868585	Blunting of R CP Angle	-	0	1	0	-	-	-	-	-	-	0.9	-	41	-	-	-	-	N	-	0	1	0	-	Pt completed & stopped ATT
116	PK	863765	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Date 9/9/19

The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.05.2019 has approved the plan of thesis of **Neeraj Saini**, a student of your college for **MD General Medicine** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

Spectrum and outcome in patients of unilateral pleural effusion admitted in a tertiary care hospital

Supervisor
Dr. Gautam Ahluwalia
Prof.,
Dept. of Medicine,
DMCH, Ludhiana.

Co-Supervisor
Dr. Akashdeep Singh
Prof.,
Dept. of Pulmonary Medicine,
DMCH, Ludhiana.

Dr. Pavneet Kaur Selhi
Prof.,
Dept. of Pathology,
DMCH, Ludhiana.

The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*
2. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN TERTIARY CARE HOSPITAL

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

Doctor of Medicine
in

MEDICINE

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES
FARIDKOT

SEPTEMBER, 2018

DR. NEERAJ SAINI

DEPARTMENT OF MEDICINE
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN A TERTIARY CARE HOSPITAL
For the degree of	M.D Medicine
Name of the candidate	Dr. Neeraj Saini
Supervisor	Dr. Gautam Ahluwalia, Professor, Department of Medicine, DMCH, Ludhiana
Co-supervisor	Dr. Akashdeep Singh, Professor, Department of Pulmonary Medicine, DMCH, Ludhiana Dr. Pavneet Kaur Selhi, Professor, Department of Pathology, DMCH, Ludhiana
Institution	Dayanand Medical College & Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Unilateral pleural effusion is a challenge for the physician as the differential diagnosis is varied. Evidence-based decision needs robust information about the etiology and epidemiology of a disease in a particular region The etiology can vary according to the geographical area, outpatient or inpatient health-care setting, patient age, among other factors. .

Aim of Study: 1. To study the spectrum of admitted adult patients aged > 18 years with unilateral pleural effusion in a tertiary care hospital. 2. To study the outcome in these patients; wherever feasible

Materials & Methods: A prospective observational study will be conducted on patients who are hospitalised in Dayanand Medical College & Hospital, Ludhiana. The study will be conducted from 1st Jan 2019 to 31st December 2019.

Clinical Significance: Over the years with increasing prevalence of HIV and malignancies, the pattern of unilateral pleural effusion is also evolving with a shift from classical presentations of disease to atypical presentation. The scenario is further compounded by confounding interpretation of laboratory investigations requiring hospitalization to establish a correct diagnosis. In our country, there is a paucity of epidemiological data about unilateral pleural effusions, especially in admitted patients. This study is aimed at delineating the etiology and clinical spectrum of unilateral pleural effusion in patients admitted in a tertiary care teaching hospital.

Keywords: Unilateral, Pleural Effusion, Clinical Presentation, Hospitalised Patients

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN A TERTIARY CARE HOSPITAL"** exist in the Department of Medicine, DMCH, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate herself under our supervision and guidance.

Supervisor

Dr. Gautam Ahluwalia
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Co-Supervisor(s)

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Place : Ludhiana

Date : 6/11/18

APPROVAL PROFORMA
BY
RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Neeraj Saini
Department	Medicine
Topic of Thesis	SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN A TERTAITARY CARE HOSPITAL
Likely date of appearing in PG examination	May 2021
Date of enrollment	9th May, 2018
Name of Head of Department	Dr. Dinesh Gupta
1) Supervisor **2) Co-Supervisor(s)**	Dr. Gautam Ahluwalia Dr. Akashdeep Singh Dr. Pavneet Kaur Selhi

Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
1. HOD Pharmacology	1. HOD Physiology
2. HOD Surgery	2. HOD Pathology
3. HOD Pathology	3. HOD Pharmacology
4. HOD Medicine	4. HOD SPM
5. Dean Academics	5. HOD Medicine
6. Vice Principal	6. HOD Surgery
	7. HOD Obst. &Gynae
	8. Legal Expert
	9. Secretary, IEC
	10. Dean Academics
	11. Vice Principal
	12. Principal

Approved: Yes / No

Chairperson
Research Committee

Chairperson
Research Committee

Approved: Yes / No

Chairperson
Ethics Committee

Chairperson
Ethics Committee

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY-

Pleural effusions are a common medical problem with more than 50 recognised causes including disease local to the pleura or underlying lung, systemic conditions, organ dysfunction and drugs.[1]

Unilateral pleural effusion is a challenge for the physician as the differential diagnosis is varied. Evidence-based decision needs robust information about the etiology and epidemiology of a disease in a particular region. The etiology can vary according to the geographical area, outpatient or inpatient health-care setting, patient age, among other factors.

In developed countries, the common causes of pleural effusions in adults are cardiac failure, malignancy and pneumonia[2,3], whereas in resource-limited countries, tuberculosis and parapneumonic effusions are more prevalent.[4,5] In fact, over the years with increasing prevalence of HIV and malignancies, the pattern of unilateral pleural effusion is also evolving with a shift from classical presentations of disease to atypical presentation. The scenario is further compounded by confounding interpretation of laboratory investigations requiring hospitalization to establish a correct diagnosis.

In our country, there is a paucity of epidemiological data about unilateral pleural effusions, especially in admitted patients. This study is aimed at delineating the etiology and clinical spectrum of unilateral pleural effusion in patients admitted in a tertiary care teaching hospital.

6.2 REVIEW OF LITERATURE

Pleural effusion is collection of fluid within the pleural space which might be because [6] of increase interstitial fluid in lungs due to increased pulmonary capillary pressure (left ventricular failure, fluid overload), decrease in plasma oncotic pressure (hypoalbuminemia), decreased pleural oncotic pressure causing increased formation (atelectasis, trapped lung), increased permeability (pancreatitis, vasculitis, malignancy), decreased lymphatic drainage (malignancy, yellow nail syndrome), diaphragmatic defects (hepatic hydrothorax) and thoracic duct rupture (chylothorax). In many cases, the etiology is multifactorial.

A basis prospective observational study was conducted by Bintcliffe et al[7] on unilateral pleural effusions with more than one apparent etiology was conducted at North Bristol National Health Services Trust (UK). Consecutive patients presenting with an undiagnosed unilateral pleural effusion were taken into study in tertiary care center. Patients underwent a diagnostic evaluation and were followed up for a minimum of 12 months. Two experienced physicians were independently recruited to record one or more diagnosis. 70% of the patients had a single cause for their pleural effusion, and 30% had multiple causes.

The study established the existence of more than one identifiable cause for unilateral pleural effusion. In this study serum N-terminal pro-brain natriuretic peptide (NT-pro BNP) was used in cases of unilateral pleural effusion and concluded that value greater or equal to 1,500 pg/ml was predictive of multiple etiologies. NT-pro BNP had a sensitivity and specificity

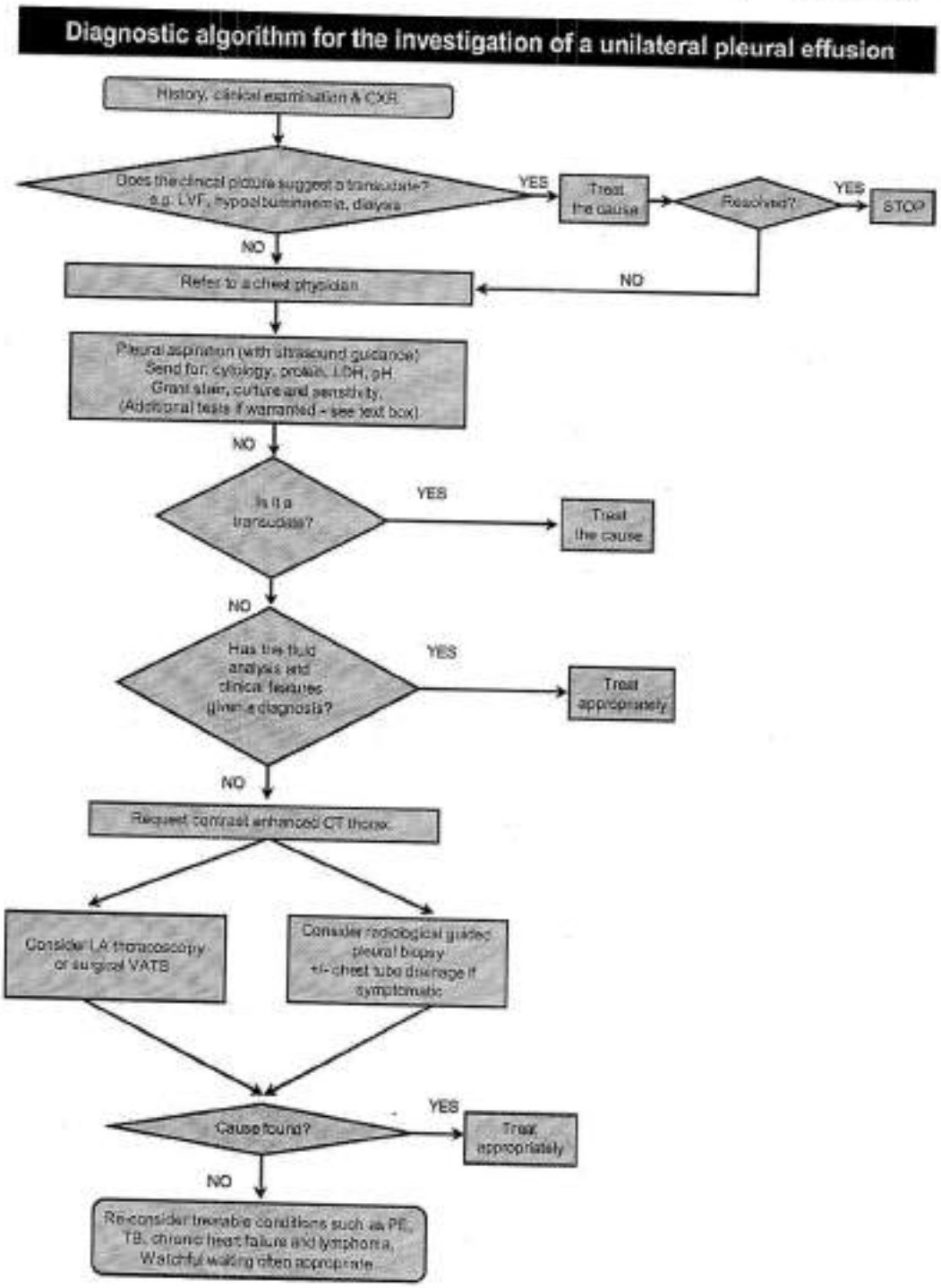
of 79 and 88%, respectively, for establishing heart failure as a primary or contributory factor.

Richard W light et al[8] gave Light's criteria in order to differentiate exudative pleural effusion from transudative pleural effusion. The pleural effusion can be said to be exudative in nature, if one or more of the following criteria are present : (1) the ratio of pleural fluid protein (Pf) to serum protein is greater than 0.5; (2) the ratio of Pf lactate dehydrogenase (LDH) to serum LDH is greater than 0.6; or (3) the Pf LDH level is greater than two thirds of the upper limit of normal for serum LDH.

Twenty percent [9] of patients with pleural effusion may falsely classify a transudative effusion as exudative. This happens when patient has been given diuretics viz. heart failure. In such patients,if the difference between serum protein and pleural fluid protein greater than 3.1 gram /dl, it should be considered as transudative pleural effusion. Similarly, if difference between serum albumin and pleural fluid albumin ratio, if more than 1.2 gram/dl, it is considered as most likely transudative effusion. Classifying the pleural effusion helps in narrowing down the differential diagnosis. Another rule is Heffner's rule to distinguish between exudate versus transudate. This rule only require pleural fluid biochemical levels as compared to light's criteria where both serum and pleural fluid values are required. The criteria are as follows

- Pf protein >2.9 g/dl
- Pf cholesterol > 45 mg /dl.
- Pf LDH > 0.45 times upper limit of lab normal serum

Clare Hooper et al[11] pioneered British thoracic society (BTS) guidelines to classify investigative approach of unilateral pleural effusion.


Diagnostic algorithm for the investigation of a unilateral pleural effusion
History, clinical examination & CXR
Does the clinical picture suggest a transudate? e.g. LVF, hypoalbuminaemia, dialysis
YES
Treat the cause
Resolved?
YES
STOP
NO
NO
Refer to a chest physician
Pleural aspiration (with ultrasound guidance) Send for: cytology, protein, LDH, pH Gram stain, culture and sensitivity. (Additional tests if warranted - see text box)
NO
Is it a transudate?
YES
Treat the cause
NO
Has the fluid analysis and clinical features given a diagnosis?
YES
Treat appropriately
NO
Request contrast enhanced CT thorax
Consider LA thoracoscopy or surgical VATS
Consider radiological guided pleural biopsy +/- chest tube drainage if symptomatic
Cause found?
YES
Treat appropriately
NO
Re-consider treatable conditions such as PE, TB, chronic heart failure and lymphoma. Watchful waiting often appropriate

Causes [6] of transudative pleural effusion are :

Heart failure (left and biventricular failure), cirrhosis of liver, nephritic syndrome, hypoalbuminaemia, constrictive pericarditis, peritoneal dialysis, duropleural fistula, urinothorax, subclavian vein thrombosis

Causes of exudative pleural effusion:

Infection – parapneumonic effusion, tuberculous pleuritis, fungal infection (coccidiodomycosis and PCP) and parasitic infection (paragonimiasis, amoebiasis)

Infiltrative – primary lung cancer, metastatic lung cancer, mesothelioma, primary lung effusional lymphoma and Kaposi sarcoma

Inflammation – collagen vascular diseases (rheumatoid arthritis, SLE), pancreatitis, sarcoidosis, BAPE (benign asbestos pleural effusion) post CABG

Infarction – pulmonary embolism and vasculitis syndrome

Drug induced – NFT, amiodarone, carbamazepine, dantrolene and dasatinib

Other causes- esophageal rupture, chylothorax, yellow nail syndrome, Meig's syndrome and thoracic endometriosis

A prospective study was carried out by Manu Mohan K et al[12] on etiological diagnosis of pleural effusion (PE) & their clinical profile. Prospective evaluation of 100 cases of pleural effusion was done .They concluded that pleural effusion is more among males (68%) and in the age group between 46 to 60 years (33%). Maximum cases (95%) were having exudative effusion. Among the exudative effusion most common cause was tuberculosis (41%). Second most common cause was malignancy (38%). Majority of tuberculous pleural effusion (63%) was right sided whereas malignant effusion was left sided (57%). The Mantoux test, pleural fluid protein, pleural fluid ADA and age of patients had statistically significant

correlation when pleural effusion due to tuberculosis and malignancy were compared.

A study was conducted by Villena V. et al[13] of 1,000 consecutive patients with pleural effusion in tertiary care hospital in Spain. The study mainly focused on etiology of the effusion and clinical presenting sign and symptoms of the patients. Prospective study on one thousand consecutive patients with pleural effusion, who underwent diagnostic thoracocentesis were studied for 9 years. Study concluded that the most common cause of PE was neoplasm (n = 364 patients). The most common place of origin of the tumor was the lung (n = 125), followed by the pleura (mesothelioma, n = 48). The most common histologic type was adenocarcinoma (n = 128). Tuberculosis was the second most common cause of PE (n = 155). PE was transudate in 118 patients, mainly secondary to heart failure. Among the 42 patients who were positive for human immunodeficiency virus (HIV), the most common cause of PE was tuberculosis. Tuberculosis was also the most likely cause of PE in patients under 40 years of age. The most common causes of PE were neoplasm and tuberculosis. Tuberculosis was the most common cause in patients under 40 years of age and in those infected by HIV.

A study was done in 2009 October at Kathmandu university medical college by Dhital KR et al[14] to study mode of clinical presentation, causes of pleural effusion, analysis of blood and pleural fluid to make diagnosis. Retrospective data was collected of patients with pleural effusion from July 2007 to July 2009 from all the cases were taken. Altogether 100 cases diagnosed with pleural effusion by chest X-ray (posterior- anterior and lateral view) and ultrasonogram of the chest were studied. The parameters taken into

account were - age group, patients demographic profile, causes, location (unilateral, bilateral), blood hemoglobin and count, sputum profile, mantoux , chest X-ray and USG findings and pleural fluid analysis [biochemical, hematological, microbiological (culture and stain) and cytological]. Age group with pleural effusion most commonly seen is 21-30 years.

Most common cause of pleural effusion was found to be tubercular effusion followed by parapneumonic effusion. In most case of tubercular parapneumonic, pleural effusion is seen on right side. Right sided effusions are also seen in malignant causes. Bilateral effusion was seen in 87.5% of the patient (7 out of 8) having underlying disease of congestive heart failure and all cases of renal disease (4 out of 4). Common mode of clinical presentation is Shortness of breath in 83% of case, cough in 67% and fever in 66% of case.

A prospective study was carried out in the Department of Pulmonary Medicine, B.J. Medical College, Ahmedabad, India by Pujan Parikh et al[15] in 2016. This study enrolled a total 100 indoor adult patients. Patients with pleural effusion as determined by clinical and or radiological means, thoracocentesis on who yield a minimum amount of fluid enough to carry out routine test were included in the study. Patients with pleural effusion with non aspirable fluid quantity decided clinically or radiologically, were excluded. Results: Most of the patients were between the age group of 31-40 years and males (68%). Most of the patients of tuberculous effusion were from younger age group between 21-50 years. Most common symptom was chest pain (72%) followed by fever (62%). Most of cases were tuberculous (62%) followed by malignant (18%). There were 15 patients with undiagnosed

pleural effusion, in which, thoracoscopic pleural biopsy was done, among them 9 patients had malignancy and 5 patients had tuberculosis pleural effusion.

A cross sectional study of 30 admitted cases with pleural effusion was conducted by M Hasan et al[16]. Most common clinical presentation was respiratory distress & fever was present in 96.7%, cough in 90%. On physical examination there is diminished chest movement, sub costal recession, and decreased breath sound on the affected side. Lobar consolidation was observed in 33.3% cases, patchy opacities in 53.3% cases. Fluid levels were seen in 76.7% cases. Straw Colored pleural fluid was seen in 56.7%, clear in 30.0%, blood stained in 13.3%.

Luis Valdés et al[17] found about that the most frequent cause of pleural effusion was tuberculosis (25%), followed by neoplasia (22.9%) and congestive heart failure (17.9%). The cause remained uncertain in 48 cases. In the neoplastic effusion group, the most frequent locations of the primary tumor were lung (32.6%), breast (11.5%), lymphoma (10.8%), and ovary (7.5%); in 21 cases (14.3% of the neoplastic group), it was not possible to identify the primary tumor. The effusions secondary to congestive heart failure, 86% (99/115) affected the right pleura or both, and 83% of effusions secondary to pulmonary thromboembolism (15/18) affected the right side. Exudative effusions showed no preference for either side in neoplastic, tuberculous, parapneumonic or empyema. Of the 97 bilateral effusions, 77 (79.4%) were secondary to heart failure (59, 60.8%) or neoplasia (18, 18.6%).

Porcel JM et al[18] conducted a retrospective analysis in Spain of three thousand consecutive thoracocentesis cases to study the etiology of pleural

effusion in adults and accuracy of pleural fluid cytology and culture in malignant and infectious pleural effusion respectively. Results showed that cancer (35%), heart failure (21%), pneumonia (19%), TB (9%), abdominal surgery (4%), pericardial disease (4%) and cirrhosis (3%). In less than thirty four age, tuberculosis is seen to be most common. Most common tumor is lung (37%) and breast (36%) and cytology has accuracy of 51% but low in case of mesothelioma and squamous cell carcinoma. Culture is positive only in 30% in case of infectious etiology. Exception is empyema (66%). Commonest organism found is streptococcus viridians.

Arya S et al[19] conducted a cross sectional study on clinic-etiological profile of patient with pleural effusion at GRMC, department of Medicine, Gwalior. Study included above 14 year of age patients with clinical and radiological evidence of pleural effusion. Sixty six percent of them exudative type of pleural effusion of these forty eight percent had tuberculosis followed by five percent had malignancy and four percent had pneumonia. Thirty five percent had transudative type of pleural effusion, of this thirty percent had hepatic involvement, twenty three percent had CCF. Acute febrile illness, nephrotic syndrome, pancreatitis, ARDS are other causes of pleural effusion.

Thoracocentesis and cytological analysis is done before biopsy and considered to be more superior as compared to biopsy. Prakash U B. et al[20] done a retrospective study consisting 414 patient with pleural effusion that underwent both thoracocentesis and pleural biopsy .Aim of the study was to compare the cytological analysis and needle biopsy for evaluation of pleural effusion. Malignancy as the cause is established by pleural biopsy in only 45 percent where as cytology revealed 57 percent. Proportion of patient with

underlying malignancy and cytology is negative and pleural biopsy revealed malignancy is only 7.1% only. Pleural biopsy was not diagnostic in non malignant pleural effusion except tuberculosis. Sensitivity of cytological analysis has higher than needle biopsy for diagnosing malignant etiology. There is limited role of pleural biopsy in pleural effusion, irrespective of malignant or non malignant except tuberculosis.

G Balachandran [21], classified pleural effusion on the basis of Chest radiograph findings which further depend on the quantity of the fluid present in the pleural space. According to following findings, grading of pleural effusion can be done blunting of lateral costophrenic sulci, meniscus sign, fluid in fissures, loss of diaphragmatic or cardiac outline, opacification of hemithorax, mediastinal shift to the opposite side. Routine erect chest X-ray required 250-300 ml of fluid to become evident. A lateral decubitus film is most sensitive, and it is able to identify even a small amount of fluid.

6.3 AIMS AND OBJECTIVES OF THE STUDY

- To study the spectrum of admitted adult patients aged > 18 years with unilateral pleural effusion in a tertiary care hospital.
- To study the outcome in these patients; wherever feasible

7. MATERIALS AND METHODS

Source of Data

All the patients aged more than 18 years admitted with unilateral pleural effusion in Department of Medicine and allied Specialties of Dayanand Medical College and Hospital (DMCH), Ludhiana.

7.2 METHOD OF COLLECTION OF DATA

Study Population

A prospective observation study will be conducted in adults patients hospitalized with unilateral pleural effusion in DMCH, Ludhiana. This study duration will be from 1st January 2019 to 31st December 2019.

Inclusion Criteria

- Age $\geq$ 18 years.
- Patients with unilateral pleural effusion admitted in department of Medicine and allied specialties.
- Pleural effusion diagnosed on chest radiograph and/or ultrasonography and/or computed tomography and/or magnetic resonance imaging.
- Pleural effusion amenable to tapping for diagnostic work up with or without radiological guidance.

Exclusion Criteria

- Age < 18 years.
- Patients with bilateral pleural effusion
- Patients not giving consent for enrollment in the study.

OUTCOME

- Diagnosis at time of discharge / discharge on request (DOR) / death / discharge against medical advice (DAMA).
- Length of stay in hospital.
- Clinical/laboratory/treatment profile of admitted patients.
- Details of pre-admission workup and treatment outside.
- Surgical Intervention(s): if any.
- Follow-up post-discharge (wherever feasible) Months: 2; 4 and 6; wherever feasible

STATISTICAL ANALYSIS

The data will be analyzed statistically using appropriate methodology. Data will be described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. All statistical calculations will be done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

Investigations considered necessary by the treating unit/ department will be evaluated. The investigations will be broadly divided into the following groups:

□ Basic investigations: CBC, ESR, LFT, RFT, Urine routine, inflammatory markers like ESR

☐ Specific investigations: pleural fluid analysis - biochemical and/or cytopathological analysis and/or nucleic acid amplification test (NAAT) and/or culture and/or histopathology of pulmonary and/or extrapulmonary biological samples

☐ Radiological investigations: Chest X-ray, USG, CT scan, MRI, others

Detailed proforma format is attached herewith with thesis plan

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith

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PROFORMA

S. No.

Name **Age** **Gender**

MRD No. **Admn. No.** **Ward/Unit**

Address **Mobile No.**

DOA **DOD**

Outcome: Discharge / Death / Discharge against medical advice (DAMA) / Discharge on Request (DOR)

Outcome diagnosis

Length of stay

In ward ____ days

In ICU ____ days

Chief Complaints at admission

Respiratory symptoms

Dyspnoea – On exertion or at rest

Severity

Cough – Dry/productive (Sputum-volume, colour, consistency)

Haemoptysis – Volume

Signature of Candidate **Signature of Supervisor/Cosupervisor**

Chest pain – Site / Radiation / Character

further details of symptoms mentioned above:

Onset / Duration / Course / Severity / Precipitating factors / Relieving factors / Associated features / Previous episodes

Fever

Continuous/Intermittent

Chills/Rigors

Evening rise

Night Sweats

Anorexia

Weight loss

CVS Symptoms

Palpitation

Breathlessness (Grade)

Fatiguability

Chest Pain

Others

further details of symptoms mentioned above:

Signature of Candidate **Signature of Supervisor/Cosupervisors**

Onset / Duration / Course / Severity / Precipitating factors / Relieving factors / Associated features / Previous episodes

Abdominal symptoms

Nausea

Vomiting

Pain abdomen:

Duration

Intensity

Radiation

Aggravating factor

Relieving factor

Abdominal distension

Jaundice

Others

Signature of Candidate **Signature of Supervisor/Cosupervisors**

Genitourinary symptoms

Burning micturition

Increased frequency of micturition

Decreased urine output

Others

CNS symptoms

Headache

Altered sensorium

Seizures

Hemiparesis

Other(s)

Past History

TB DM HTN CAD

CKD CLD Polyarthritis

other underlying comorbidity-

Surgical history - pancreatitis /CABG/thoracic surgery / others Blood transfusion

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Occupational history

Personal History

- Vegetarian/Non-vegetarian
- Smoker/Non-smoker
- Alcoholic/Non alcoholic: Duration Quantity
- Substance abuse

Menstrual history (female patients) - regular amount of flow

Obstetrical

Any temporal association with respiratory symptoms

Family history

Drug history

Methotrexate

Amiodarone

Phenytoin

Nitrofurantoin

Others

Signature of Candidate **Signature of Supervisor/Cosupervisors**

General physical examination

Appearance sensorium

Pallor Icterus Cyanosis

Clubbing Edema: Pitting/non-pitting

Skin: Rash Type of rash

LAP Trachea Thyroid JVP

Vitals

Temperature SBP DBP Pulse RR

Nutritional assessment - body weight height BMI

Systemic examination

Respiratory

Abdomen

Signature of Candidate **Signature of Supervisor/Cosupervisors**

CNS

CVS

Investigations

Parameters	At admission	At discharge
Hemogram		
Hb		
MCV		
TLC		
DLC		
Platelet		
ESR		
PBF		

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LFT		
Total bilirubin		
Direct bilirubin		
SGOT		
SGPT		
ALP		
Total protein		
Serum Albumin		
A:G ratio INR/PT		
RFT		
Blood urea		
Serum Creatinine		
Serum Electrolyte Na/K/Cl		
Ca/Mg/Phos		
Uric acid		
CRP		
BNP		
Urine R/E		
Viral markers AntiHIV(Rapid/ELISA)		
AntiHCV (Rapid/ELISA)		
HbsAg (Rapid/ELISA)		

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Mantoux test – induration size	
Connective tissue profile ANA /RF	

Cultures

Blood culture and sensitivity

- Bacterial
- Fungal

Urine culture and sensitivity

Bacterial

Fungal

Specific investigations

Pleural fluid

Parameters	**Value**
Gross appearance	
Amount **Diagnostic** **Therapeutic**	
pH	
BIOCHEMISTRY: **Fluid albumin** **Fluid protein** **Serum protein**	**Ratio**
Fluid LDH **Serum LDH**	**Ratio**
Fluid glucose	
CYTOLOGY:	

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TLC and DLC	
Microbiological: **Gram staining** **Acid fast staining**	
CBNAAT	
LPA	
ADA	
ANA	
RF	
Flow cytometry for diagnosis of lymphoma	
M cells	
Pleural fluid c/s	

- **Pleural biopsy**
  - Histopathology
  - CBNAAT

- **Sputum examination**
  - Gram stain
  - ZN stain

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- ADA
- Culture and sensitivity

- CBNAAT
-
- LPA

- LJ Medium

- Others
- **LN**
- FNAC

- Biopsy

- Others

- **Bone Marrow**
- Aspiration

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- Biopsy
- Flowcytometry

- **Other tissue diagnosis**

- **Infection related assays**
- Widal
- Dengue serology
- Dengue NS 1 antigen
- Malaria antigen
- Leptospira serology
- Scrub typhus
- Brucella
- Anti HAV
- Anti HEV

- **Radiological investigations**
- chest x-ray finding-

  blunting of the posterior costophrenic angle

  blunting of the lateral costophrenic sulci

  meniscus sign

  fluid in the fissures

  loss of diaphragmatic or cardiac oudine opacification of hemithorax

  mediastinal shift to the opposite side

Signature of Candidate **Signature of Supervisor/Cosupervisors**

- USG Chest
- USG abdomen
- CT Scan
- MRI

Other Investigations

- 2 D ECHO
- VATS

Signature of Candidate **Signature of Supervisor/Cosupervisors**

Outside reports

Any other investigation(s)

Surgical intervention

Signature of Candidate **Signature of Supervisor/Cosupervisors**

FOLLOW UP

2MONTH/4 MONTH/ 6 MONTH

Date-

Constitutional features -

Improvement in previous clinical symptoms and signs

Appearance of new clinical symptoms/signs

Investigations-

Signature of Candidate **Signature of Supervisor/Cosupervisors**

INFORMED PATIENT CONSENT

Date: _____

I.....D/o, W/o, S/o.....

.....am willing to participate in the study **"SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN TERTIARY CARE HOSPITAL"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

.....
Signature of the Witness

.....
Signature of the patient

Signature of Supervisor

Signature of Candidate

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____

निवासी _____

इस शोधकार्य **"SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN TERTIARY CARE HOSPITAL"** में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

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गवाह के हस्ताक्षर रोगी के हस्ताक्षर/अंगूठे का निशान

नाम: नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____

"SPECTRUM AND OUTCOME IN PATIENTS OF UNILATERAL PLEURAL EFFUSION ADMITTED IN TERTIARY CARE HOSPITAL" ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

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ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

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ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

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ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ